

ORDNANCE SYSTEMS INC.  
Radford Army Ammunition Plant  
4050 Pepper's Ferry Road  
Radford Virginia 24141

September 15, 2015

Leslie Romanchik  
Hazardous Waste Program Manager  
Virginia Department of Environmental Quality  
629 East Main Street  
Richmond, Virginia 23219

**Subject: RFAAP Open Burning Ground Permit Application NOD Response**  
**Radford Army Ammunition Plant, Radford, Virginia**  
**EPA ID#: VA1210020730**

Dear Ms. Romanchik:

Attached, please find our responses to the completeness review issued by the Virginia Department of Environmental Quality (DEQ) July 21, 2015, for the Open Burning Ground (OBG) Resource Conservation and Recovery Act (RCRA) renewal application submitted in June 2015.

For each deficiency provided by DEQ, we have provided a written response and summarized the action items resulting from the NOD. In the text below, DEQ's comment is provided in italic print, and RFAAP's response is provided in normal print.

- 1. The application does not contain traffic information as required by checklist item B-4. Please either indicate where this information is included in the permit or provide a revised application which includes this information.*

The requested traffic map for the OBG area was accidentally omitted from the permit application. A copy of the map is being provided with this response. The map should be inserted into Attachment II.A as Figure II.A-7.

- 2. The application does not contain language which provides a report of demonstration of the effectiveness of the thermal treatment of waste in the burning pans based on laboratory or field data as required by checklist item C-1g. Please either indicate where the language is included in the permit application or provide a revised permit application which includes this information.*

RFAAP routinely analyzes the ash residue generated from the OBG operations for reactivity as described in Section II.B.5b of Attachment II.B to the permit renewal application. The intent of this analysis is to demonstrate that all energetic components of the material have been thermally destroyed during the thermal treatment process. Should the ash be found to still contain reactive components, it will be reloaded onto the pans, treated, and reanalyzed. Copies of the most recent sets of these analyses have been provided for DEQ's inspection during the review of the permit application. However, we request that the actual analytical results be excluded from the actual permit. We have added a paragraph to Section II.B.5b to indicate that the results of these analyses are maintained to demonstrate compliance with the requirements of 9 VAC 20-60-1010.K.8. A modified Attachment II.B is included with this submittal.

3. *The application does not contain language which describes the procedures used to inspect and/or analyze a representative portion of wastes generated off-site from the New River Unit. Please either indicate where the language is included in the permit or provide a revised application which includes the information required by checklist item C-2e.*

RFAAP no longer intends to add the NRU waste materials to the potential waste mix at the OBG. All references to NRU waste have been removed from the revised Attachment II.B included with this submittal. Any references to NRU waste found elsewhere in the application will be revised following DEQ's technical review of each section.

4. *The application does not contain language which provides a report of demonstration of the effectiveness of the thermal treatment of waste in the burning pans based on laboratory or field data as required by checklist item D-8c. Please either indicate where the language is included in the permit application or provide a revised permit application which includes this information.*

RFAAP routinely analyzes the ash residue generated from the OBG operations for reactivity as described in Section II.B.5b of Attachment II.B to the permit renewal application. The intent of this analysis is to demonstrate that all energetic components of the material have been thermally destroyed during the thermal treatment process. Should the ash be found to still contain reactive components, it will be reloaded onto the pans, treated, and reanalyzed. Copies of the most recent sets of these analyses have been provided for DEQ's inspection during the review of the permit application. However, we request that the actual analytical results be excluded from the actual permit. We have added a paragraph to Section III.D of Module III to indicate that the results of these analyses are maintained to demonstrate compliance with the requirements of 9 VAC 20-60-1010.K.8. A modified Module III is included with this submittal.

5. *The application does not contain language which demonstrates the prevention of hazards in unloading operations (e.g., use of ramps or special forklifts) as required by checklist item F-4a. Please either indicate where the language is included in the permit application or provide a revised permit application which includes the information.*

The back of the powder van is equipped with lift gate to facilitate loading and unloading of the van. Absent this, all waste unloading that occurs at the OBG is performed manually, without the use of ramps or special forklifts. All waste cans are loaded to ensure that the weight is below that deemed safe for manual handling. To help satisfy this requirement, we had added a condition to Module II of the permit. Section II.G.2 of the revised Module II included with this submittal addresses prevention of hazards in unloading operations.

6. *The application does not contain language which demonstrates the mitigation of effects of equipment failure and power outage as required by checklist item F-4d. Please either indicate where the language is included in the permit application or provide a revised permit application which includes the information.*

No powered equipment is utilized at the OBG in the waste treatment operations. Wastes are manually loaded into the pans and then ignited with a battery-powered igniter. Therefore, there are no so effects to describe in the permit application.

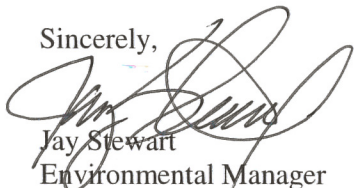


7. *The application does not contain language for the procedure to extend the closure period if necessary as required by checklist item I-1d(1)(a). Please either indicate where this language is included in the permit application or provide a revised permit application which includes the information.*

The revised Attachment II.G included with this submittal has been modified to include the requested language. Please reference Section II.G.6 of the revised. plan for the requested addition.

If you have any questions or concerns regarding our responses, please contact Mr. Matt Alberts at 540/639-8722 (matt.alberts@baesystems.com).

Sincerely,



Jay Stewart  
Environmental Manager  
BAE Systems, Ordnance Systems Inc.

Enclosure:

Attachment 1 - Revised Sections of the OBG RCRA permit application

c: Russ McAvoy, VDEQ-CO  
Ashby Scott, VDEQ-CO

Coordination:

  
J. McKenna

bc: J. Stewart, BAE Staff  
J. McKenna, Army Staff  
Matt Alberts, BAE Staff  
Michele Gehring, Coterie Environmental  
Env. File

## **MODULE II – GENERAL FACILITY CONDITIONS**

**Comment [RFAAP1]:** Suggested revisions added June 2015 as part of the RCRA permit renewal application for the RFAAP open burning ground

### **II.A. WASTE ANALYSIS**

#### **II.A.1. General Waste Analysis**

The Permittees shall follow the procedures described in the Waste Analysis Plan, Attachment II.B. Waste analysis shall require, at a minimum, the maintenance of proper functional instruments, use of approved sampling and analytical methods, verification of the validity of sampling and analytical procedures, and correct calculations. If the Permittees do not have -sufficient capability for analysis, then the Permittees shall inform the laboratory performing the analysis that the laboratory must operate under the waste analysis conditions placed on the Permittees.

### **II.B. SECURITY**

The Permittees shall comply with the security provisions of 40 CFR 264.14. The security provisions shall follow the outline in Attachment II.H.

### **II.C. GENERAL INSPECTION REQUIREMENTS**

The Permittees shall follow the inspection schedule set out in the Inspection Schedule, Attachment II.D. The Permittees shall remedy any deterioration or malfunction discovered during an inspection as required by 40 CFR 264.15(c). Records of inspections shall be kept as required by 40 CFR 264.15(d) and Permit Condition II.I.2.~~dc.xii~~.

### **II.D. PERSONNEL TRAINING**

The Permittees shall conduct personnel training as required by 40 CFR 264.16. This training program shall follow Personnel Training, Attachment II.E. The Permittees shall maintain training documents and records as required by 40 CFR 264.16(d)(4) and 264.16(e) as well as Permit Conditions II.I.2.~~ba.vii~~ and II.I.2.~~dc.iii~~x.

### **II.E. GENERAL REQUIREMENTS FOR REACTIVE WASTE**

The Permittees shall comply with the requirements of 40 CFR 264.17.

### **II.F. FLOODPLAIN STANDARD**

The Permittees shall comply with the requirements of 40 CFR 264.18(b). The Permittees shall follow the flood plan in Attachment II.I.

## **II.G. PREPAREDNESS AND PREVENTION**

### **II.G.1. Design and Operation of Facility**

The Permittees shall maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of hazardous waste constituents to air, soil, or surface water that could threaten human health or the environment.

### **II.G.2. Preventive Procedures, Structures, and Equipment**

The facility shall maintain appropriate procedures and necessary equipment to help prevent hazards from unloading operations pursuant to 9 VAC 20-60-1010.B.8.a. This shall, at a minimum, include procedures for ensuring that all waste cans are maintained at or below weights suitable for manual lifting or movement and, when appropriate, the use of powered lift-gates on vehicles used to transport waste from the storage facilities to the OBG.

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### **II.G.23. Required Emergency Equipment**

At a minimum, the Permittees shall equip the facility with the emergency equipment set forth in the Contingency Plan, Attachment II.F, as required by 40 CFR 264.32.

### **II.G.34. Testing and Maintenance of Emergency Equipment**

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The Permittees shall test and maintain the equipment specified in Permit Condition II.G.23 and in Attachment II.F as necessary to assure its proper operation in time of emergency.

### **II.G.45. Access to Communications or Alarm System**

The Permittees shall maintain access to the communication or alarm system as required by 40 CFR 264.34.

### **II.G.56. Arrangements with Local Authorities**

The Permittees shall maintain arrangements with State and local authorities as required by 40 CFR 264.37. If State and local officials refuse to enter into or renew existing preparedness and prevention arrangements with the Permittees, the Permittees shall document this refusal in the operating record pursuant to Permit Condition II.I.2.ed.iv.

## **II.H. CONTINGENCY PLAN**

### **II.H.1. Implementation of Plan**

The Permittees shall immediately carry out the provisions of the Contingency Plan, Attachment II.F, and follow the emergency procedures described by 40 CFR 264.56, whenever there is an imminent or actual fire, explosion, or release of hazardous waste or constituents ~~which that~~ threaten or could threaten human health or the environment. ~~The Permittees shall comply with the reporting requirements provided in I.D.11.~~

**Comment [RFAAP2]:** Removed this text to make language consistent with the EWI permit. This requirement is contained later in the Permit.

### **II.H.2. Copies of Plan**

The Permittees shall comply with the requirements of 40 CFR 264.53.

### **II.H.3. Amendments to Plan**

The Permittees shall review and immediately amend, if necessary, the ~~contingency-Contingency plan~~ Plan, as required by 40 CFR 264.54.

### **II.H.4. Emergency Coordinator**

The Permittees shall comply with the requirements of 40 CFR 264.55.

### **II.H.5. Emergency Procedures**

The Permittees shall comply with the requirements of 40 CFR 264.56 including the recordkeeping and reporting requirements specified in Permit Condition II.I.2.~~ac.ivii.~~

## **II.I. RECORDKEEPING AND REPORTING**

### **II.I.1. Notification, Certification, and Recordkeeping Requirements**

In addition to the recordkeeping and reporting requirements specified elsewhere in this Permit, the Permittees shall comply with all ~~the~~ applicable notification, certification, and recordkeeping requirements described in 40 CFR 264.73(b)(12) and 268.7.

### **II.I.2. Operating Record**

The Permittees shall maintain a written operating record at the facility, consisting of records kept for the lengths of time specified below. The record can be a compilation of various documents. The operating record shall include, but ~~shall~~ not be limited to, the information listed below:

**Comment [RFAAP3]:** Changes in this section made to reflect those implemented as a result of the April 2006 burden reduction rule. See Federal Register Vol. 71, No. 64, pp. 16862 - 16915.

- a. The following records shall be maintained until closure is complete and certified:
- i. A current map showing the location of hazardous waste management units and non-regulated units within the facility;
  - ii. A map showing all locations of past hazardous waste management units if different from present locations;
  - iii. Pursuant to 40 CFR 264.73(b)(1), a description and the quantity of each hazardous waste received, and the method(s) and date(s) of its treatment, storage, or disposal at the facility;  
~~The time, date, and details of any incident that requires implementation of the contingency plan, including copies of all reports prepared pursuant to 40 CFR 264.56(j) and Permit Condition II.H.5. or I.D.11.e.;~~
  - ~~iii. All reporting and submittals prepared pursuant to Permit Condition I.D.13;~~
  - ~~iv. Records and results of waste analyses required by 40 CFR 264.13, pursuant to 40 CFR 264.73(b)(3), which shall include at a minimum:~~
    - ~~A. The date(s), exact place, and times of sampling or measurements;~~
    - ~~B. The name of the individual(s) who performed the sampling or measurements;~~
    - ~~C. The date(s) analyses were performed, demonstrating that holding times for the methods specified in the Waste Analysis Plan, Attachment II.B were satisfied;~~
    - ~~D. The name of the individual(s) who performed the analyses;~~
    - ~~E. The analytical techniques or method used;~~
    - ~~F. The analytical results;~~
    - ~~G. The QA/QC summary; and~~
    - ~~H. The type and model number of the equipment used for analysis;~~
  - ~~v. All waste determinations, waste profiles, and waste feed composition determinations made pursuant to the Waste Analysis Plan, Attachment II.B.~~

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- ~~vi.~~ ~~Certifications pursuant to 40 CFR 264.73(b)(9) (Waste Reduction Plan); and~~
- iv. All submittals prepared pursuant to Permit Condition I.D.13 (revised or supplemental permit application materials);
- v. The notice and certification required by a generator under 40 CFR 268.7 (Land Disposal Restrictions) pursuant to 40 CFR 264.73(b)(10).
- ~~vii.~~ Training records of current facility personnel pursuant to 40 CFR 264.16(e);
- ~~vi.~~
- ~~b.~~ The following records shall be maintained until post closure is complete and certified:
- ~~i.vii.~~ Records of spills and releases required by existing environmental laws, including, but not limited to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act; and
- ~~ii.viii.~~ Written reports and records of verbal notification to the Director and the Administrator to address releases, fires, and explosions;
- ~~iii.~~ All reports of noncompliance pursuant to Permit Condition I.D.12;
- ~~iv.~~ All reports prepared pursuant to Permit Condition I.D.11;
- ~~v.~~ Records of all monitoring information pursuant to Permit Condition I.E.; and
- ~~vi.~~ Training records of current facility personnel.
- ~~e.b.~~ The following records shall be maintained for a minimum of 5 years. This time period may be extended by the Department in the event of enforcement action or notification by the Department that an investigation is ongoing.
- ~~i.~~ Facility operation and maintenance records and reports prepared pursuant to this Permit; and
- ~~ii.i.~~ Progress reports and any required notifications prepared pursuant to this Permit. Monitoring, testing, or analytical data, where required by this Permit.
- ~~d.c.~~ The following records shall be maintained for a minimum of 3 years. This time period may be extended by the Department in the event of enforcement action or notification by the Department that an investigation is ongoing.

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- i. Generator biennial reports submitted in compliance with 40 CFR 262.41;
- ii. Facility biennial reports submitted in compliance with 40 CFR 264.75;
- iii. All reports of noncompliance pursuant to Permit Condition I.D.12;
- iv. All reports prepared pursuant to Permit Condition I.D.11;
- v. Facility operation and maintenance records and reports prepared pursuant to this Permit;
- vi. Progress reports and any required notifications prepared pursuant to this Permit;
- vii. Summary reports and details of any incident that requires implementation of the Contingency Plan, including copies of all reports prepared pursuant to 40 CFR 264.56(i) and Permit Condition II.H.5 or I.D.11.c;
- viii. Certifications pursuant to 40 CFR 264.73(b)(9) (Waste Reduction Plan);
- ~~iii-ix.~~ ix. Training records of former facility personnel pursuant to 40 CFR 264.16(e);
- ~~iv.~~ Records of all monitoring information pursuant to Permit Condition I.E.3.; and
- ix. Records and results of waste analyses required by 40 CFR 264.13, pursuant to 40 CFR 264.73(b)(3), which shall include at a minimum:
  - A. The date(s), exact place, and times of sampling or measurements;
  - B. The name of the individual(s) who performed the sampling or measurements;
  - C. The date(s) analyses were performed, demonstrating that holding times for the methods specified in the Waste Analysis Plan, Attachment II.B were satisfied;
  - D. The name of the individual(s) who performed the analyses;
  - E. The analytical techniques or method used;
  - F. The analytical results;

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**G. The QA/QC summary.**

- x. All waste determinations and waste profile determinations made pursuant to the Waste Analysis Plan, Attachment II.B.
- xi. Records of all monitoring information pursuant to Permit Condition I.E.3.; and
- xii. Records of all inspections, pursuant to 40 CFR 264.15(d), which shall include at a minimum:
  - A. The date and time of the inspection;
  - B. The name of the person performing the inspection;
  - C. A notation of the observations made; and
  - D. The date and nature of any repairs or remedial actions.

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d. Current copies of the following documents as amended, revised, and modified shall be maintained at the facility until closure and corrective action are complete and certified:

- i. Contingency Plan;
- ii. Personnel Training;
- iii. Waste Analysis Plan;
- iv. Documentation of arrangements made with local authorities pursuant to 40 CFR 264.37;
- v. Closure Plan;

**II.J. CLOSURE**

**II.J.1. Performance Standard**

The Permittees shall close the permitted treatment and storage area as required by 40 CFR 264.111, and in accordance with the Closure Plan, Attachment II.G.

**II.J.2. Amendments to Closure Plan**

The Permittees shall amend the ~~closure-Closure plan-Plan~~ in accordance with 40 CFR 264.112 whenever necessary.

II.J.3. Notification of Closure

The Permittees shall notify the Director at least 45 days prior to the date they expect to begin closure as required by 40 CFR 264.112(d).

II.J.4. Time Allowed for Closure

After receiving the final volume of hazardous waste, the Permittees shall treat or remove from the permitted treatment and storage area all hazardous waste and shall complete closure activities in accordance with the schedules specified in the Closure Plan, Attachment II.G.

II.J.5. Disposal or Decontamination of Equipment

The Permittees shall decontaminate and/or dispose of all facility equipment as required by 40 CFR 264.114 and the Closure Plan, Attachment II.G.

II.J.6. Certification of Closure

The Permittees shall certify that the permitted treatment and storage area has been closed in accordance with the specifications in the closure plan as required by 40 CFR 264.115.

## **MODULE II – LIST OF ATTACHMENTS**

The following Attachments are incorporated, in their entirety, by reference into this Permit. These incorporated attachments are enforceable conditions of this Permit. Some of the documents contain excerpts from the Permittees' Hazardous Waste Permit Application. The Department has, as deemed necessary, modified specific language excerpted from the permit application. Additional modifications are prescribed in the Permit Conditions (Modules I through IX), and thereby supersede the language of the attachments. Facility operations shall be in accordance with the contents of the Attachments and this Permit.

Attachment II.A – Facility Description

Attachment II.B – Waste Analysis Plan

Attachment II.C – Soil Monitoring Program

Attachment II.D – Inspection Schedule

Attachment II.E – Personnel Training

Attachment II.F – Contingency Plan

Attachment II.G – Closure Plan

Attachment II.H – Security Provisions

Attachment II.I – 100-Year Floodplain Protection Plan

**ATTACHMENT II.B**

**WASTE ANALYSIS PLAN**

**Comment [RFAAP1]:** Suggested revisions added June 2015 as part of the RCRA permit renewal application for the RFAAP open burning ground



## ATTACHMENT II.B – WASTE ANALYSIS PLAN

### II.B.1. Waste Characteristics

Those ~~H~~hazardous wastes that may be managed at the permitted open burning grounds (OBG) are waste ~~propellants~~ energetic materials and spill "clean-up" residues generated at the Radford Army Ammunition Plant (RFAAP) by either the contracted operator (the Permittees) or one of the RFAAP tenant organizations, ~~or waste energetic materials generated by the Permittees or tenants at the nearby New River Unit (NRU). The NRU is under the same management and control as the RFAAP, but it not adjoined to the contiguous property defined as the RFAAP. No~~ wastes generated outside of the RFAAP ~~or the NRU~~ will be received, stored, or treated at the permitted storage and treatment area. No waste materials are stored at the OB site. They are transported to the site directly from the production plant or from established <90-day accumulation areas.

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~~These wastes may be which are hazardous due to their ignitability (D001), or reactivity (D003), or toxicity for various compounds. Only those hazardous wastes, which that are consistent with the requirements of the facility's RCRA Permit and this Waste Analysis Plan will be open burned. No wastes generated outside of RFAAP will be received, stored, or treated at the open burning ground. Only wastes generated at the RFAAP may be treated at the permitted treatment area.~~

Comment [RFAAP2]: Deleted, as this is duplicative of text that follows

The waste streams treated at the ~~open burning ground~~ OBG include the same raw material as the production materials generated at the RFAAP but they fail to meet some performance specification either due to operational upsets, misformulations, etc. As a result, production records and formulation data can usually be used to determine whether the waste is suitable for treatment at the ~~burning ground~~ OBG. However, when this information is not sufficient to make that conclusion, other data may be gathered to resolve the issue. In some cases, a small test burn of this material may provide adequate information on the suitability of this waste for the ~~burning ground~~ OBG.

Comment [RFAAP3]: Relocated from other section of the plan

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~~Wastes managed in accordance with the facility's RCRA Permit will be limited to the following:~~ In general, the managed wastes include

a. ~~Wastes which that exhibit only~~ the following hazardous characteristic(s):

Comment [RFAAP4]: Note – there are no new waste codes being added with this permit application. We are simply updating the text to be consistent with the codes managed and the information previously specified elsewhere in this section.

- i. Reactivity (hazardous waste number D003) as specified in 9 VAC 20-60-261, incorporating 40 CFR 261.23 by reference; or
- ii. ~~Reactivity (hazardous waste number D003) as specified in 9 VAC 20-60-261, incorporating 40 CFR 261.23 by reference, and the~~

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~~characteristic of~~ Toxicity, as specified in 9 VAC 20-60-261, incorporating 40 CFR 261.24 by reference, for one or more of the following contaminants;

- a) Arsenic (hazardous waste number D004);
- b) Barium (hazardous waste number D005);
- c) Cadmium (hazardous waste number D006);
- d) Chromium (hazardous waste number D007);
- e) Lead (hazardous waste number D008);
- f) Mercury (hazardous waste number D009);
- g) Selenium (hazardous waste number D010);
- Silver (hazardous waste number D011); and
- h)
- i) 2,4-Dinitrotoluene (hazardous waste number D030).
- ~~a) :~~
- ~~b) Barium (hazardous waste number D005)~~

- iii. Ignitability (hazardous waste number D001) as specified in 9 VAC 20-60-261, incorporating 40 CFR 261.21 by reference. ~~Ignitable wastes are limited to clean up residue of propellant ingredients from energetic operations. If mixtures of sawdust and cleanup residue are not D001 or D003, then they are not allowed to be open burned.~~

- ~~b. Wastes which are not listed pursuant in 9 VAC 20-60-261, incorporating 40 CFR 261.31, 32, and 33 by reference; and~~

- ~~c. Wastes which are one of the following:~~

~~Off-specification propellants and propellant intermediates, generated at RFAAP;~~

- ~~i. Load, assemble and pack waste, consisting of energetic materials from assembling cartridges~~
- ~~ii. Specialty product wastes containing propellant with nitrocellulose, nitrate esters, nitroguanidine, solid explosives, and one of the following combinations of additional materials:~~
  - ~~a) 40 CFR 261, Appendix VIII constituents (D003)~~
  - ~~b) 40 CFR 261, Appendix VIII constituents, chlorides and/or perchlorates (D003)~~
  - ~~c) 40 CFR 261, Appendix VIII constituents and/or metals (D003, D004-D010)~~
- ~~iii. Other miscellaneous waste, described in Table 1, as one of the following:~~
  - ~~a) Ignitable and reactive liquids in sawdust (D001, D003)~~

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~~b) Off specification dinitrotoluene, trinitrotoluene, and Isotriol~~

Under no circumstances will the following materials be managed at the ~~open burning ground~~OBG:

- i. Radioactive wastes, or mixed radioactive and hazardous wastes;
- ii. Wastes that are listed pursuant to 9 VA 20-60-261, incorporating 40 CFR 261.31, 32, and 33, by reference, will be managed at the permitted treatment area.
- iii. Any material contaminated with or suspected of being contaminated with military warfare agents accepted for thermal treatment at the OB unit. Examples of such chemical warfare agents are:

Choking agents  
Nerve agents  
Blood agents  
Blister agents  
Incapacitating agents  
Vomiting compounds  
Tear producing compounds  
Herbicides

- iv. Smoke and incendiary devices, as these materials are not suitable for treatment at the ~~OB Ground~~OBG for a variety of reasons.

Only those hazardous wastes that are within the specifications of the facility's RCRA Permit and this Waste Analysis Plan will be open burned. A specific list of those wastes permitted for burning at the ~~open burning grounds~~OBG is provided in Table I of Appendix II.B-1. As shown in the table, ~~the wastes identified above are described in more detail in Section II.B.2 and in Tables 1 and 2. Tables 1 and 2 delineate twenty waste Groups, classified into one of 20 different waste groups that are described in detail in Section II.B.2. These Group group numbers were assigned as the information on the waste Groups-groups was collected. -and-~~There is no significance to the order of the discussion in Section II.B.2 below or the group numbers in Table I of Appendix II.B-1.

~~Radioactive wastes, mixed radioactive and hazardous wastes, and listed wastes will not be stored or treated at the permitted OB Ground.~~

II.B.2. Waste Composition and Characterization

The composition of the energetic waste ~~propellant~~ mixtures generated and sent to the ~~Open Burning Grounds~~ OBG varies due to changes in the production schedule. ~~Off specification propellants and propellant intermediates, dinitrotoluene (including production intermediates), load, assemble and pack waste, specialty product waste, and other miscellaneous wastes, as presented in Table 1, are the categories of wastes which may be stored or treated.~~ However, all of the wastes can be categorized into one of the

~~Table 1 provides~~ 20 Groups of waste identified in Table I of Appendix II.B-1s. This table identifies each waste by group number and specifies the RCRA hazardous waste codes that may be applicable to that group. Information on the 40 CFR Part 261 Appendix VIII constituents that may be present in each group is provided in Table II of Appendix II.B-1. ~~Wastes that are treated fit into one of these Groups.~~ If the Permittees wish to manage waste whose formulation is not consistent with one of the groups identified in Table I of Appendix II.B-1, the Permittees will submit a request for permit modification.

**Comment [RFAAP5]:** Note that under our current permit, RFAAP is submitting a notification to DEQ of any new waste streams added to each of these groups. Consistent with the way in which the WAP and Permit is written, we should only need to provide notification if the waste does not fit into one of the 20 Groups classified herein. The change indicate has been made to reflect the proper process

Wastes from all groups except Groups 2, 3, 5, and 6 may be treated by open burning when ~~any of the following conditions are satisfied:~~

- i. ~~The M~~material cannot be safely put through the ~~grinder~~waste feed preparation system at the hazardous waste incinerators. This may include ~~Such~~ material that may be ~~may be~~ contaminated with tramp metal objects, rocks, and similar debris that will damage the grinder.
- ii. The material cannot be safely treated at the incinerators. Certain propellants, intermediate products, and essential materials cannot be ground or mixed with water due to their reactive nature, geometry, or specific hazard. If the waste is not in slurry form ~~or cannot be mixed into slurry form~~ it is not ~~safe possible to feed the material to to treat in~~ the incinerators.
- iii. The incinerators are down for maintenance or are inoperable because of mechanical failure and the reactive waste accumulation areas are not capable of handling any additional material in accordance with Army and/or ~~Alliant~~ BAE/OSI policy on building capacity.

In ~~any of~~ these circumstances, a hazards analysis will be performed and the results of that analysis ~~will~~ be placed in the operating record. The material will ~~then be~~ burned at the ~~open burning grounds~~ OBG rather than at the incinerators ~~not be treated in the RFAAP hazardous waste incinerator system~~ because of an undue risk of an incident ~~but will be treated by open burning~~. All of the waste accepted for treatment at the OB-Ground is considered hazardous prior to treatment because of its explosive, reactive, or flammable nature or because it meets RCRA toxicity thresholds for certain compounds. Full hazard characteristics analyses are not

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performed prior to open burning to avoid danger associated with excess handling of such materials and to eliminate costly and potentially dangerous time delays. The waste is visually inspected prior to treatment to ensure that only appropriate wastes are subjected to thermal treatment.

Examples of material typically open burned include:

- i. Waste generated from floor cleanings ~~(excluding listed wastes)~~ in operating buildings;~~which contains more than one reactive waste group.~~
- ii. Primers, flashtubes, and projectiles ~~from Group 15~~ that have been tested and proven not to detonate when burned but ~~that~~ contain metal that renders them not suitable for treatment in the incinerator. ~~At no point, will listed wastes be open burned.~~
- iii. Items such as press heels and rocket grains ~~that~~ are too long or ~~too~~ large to fit into the grinder.

Information to ensure safe handling of materials to be treated at the OB-Ground is available in historical data and ordnance publications. In the case of materials that have no such information, chemical and physical analyses are performed to determine its reactivity, stability, and ignitability characteristics.

~~Table 2, List of Propellant Ingredients, presents the constituents and the percentage range of waste constituents that may be in the 20 Groups.~~

~~If the Permittees wish to manage waste whose formulation is not consistent with one of the Groups identified in Table 1 of this Waste Analysis Plan, the Permittees will submit a request for permit modification.~~

#### II.B.2a. Off-Specification Propellant and Propellant Production Intermediates

Table 1 of Appendix II.B-1 identifies nine groups that contain single, double, or triple base propellants and propellant intermediates. These three categories of propellant that differ in their primary **energetic** constituents, as follows:

<del>Primary Category</del>	<del>Primary Constituent(s)</del>
<del>Single Base</del>	<del>Nitrocellulose</del>
<del>Double Base</del>	<del>Nitrocellulose, nitroglycerine</del>
<del>Triple Base</del>	<del>Nitrocellulose, nitroglycerine, nitroguanidine</del>

- Single base propellants contain nitrocellulose;
- Double base propellants contain two energetics, typically nitrocellulose and nitroglycerin; and



- Triple base propellants contain three energetics, typically nitrocellulose, nitroglycerin, and nitroguanidine.

These nine groups ~~categories~~ have been ~~further divided into a total of nine waste Groups~~, based on the primary propellant category and the other waste constituents that distinguish them from each other. The nine ~~Groups~~ groups are as shown in Table I in Attachment II.B, Appendix II.B-1.:

- ~~Group 7 Single base propellants with nitrocellulose and lead (D003, D008)~~
- ~~Group 8 Single base, propellants with nitrocellulose (D003)~~
- ~~Group 9 Single base propellants with nitrocellulose and dinitrotoluene (D003, D030)~~
- ~~Group 10 Double base propellants with nitrocellulose and nitrate esters (D003)~~
- ~~Group 11 Double base propellants with nitrocellulose, nitrate esters, and perchlorate salts (D003)~~
- ~~Group 12 Double base propellants with nitrocellulose, lead, and nitrate esters (D003, D008)~~
- ~~Group 13 Double base propellant with nitrocellulose, nitrate esters, and solid explosives (D003)~~
- ~~Group 14 Triple base propellant with nitrocellulose, nitrate esters and nitroguanidine (D003)~~
- ~~Group 16 Single base propellant with nitrocellulose, dinitrotoluene and lead (D003, D008, D030)~~

#### II.B.2b. Liquid Wastes with Glycol

The waste streams containing diethylene glycol (DEG) and triethylene glycol (TEG) are generated from the washing of nitroglycerin (NG) and diethylene glycol dinitrate (DEGDN) with water to remove the desensitizing agents DEG and TEG from the NG and DEGDN. These waste streams are non-hazardous. They contain water (80-85%) and glycol (15-20%) and may be used in the production of slurry batches for incineration in Tanks T-1A and T-1B. The waste groups for these streams are identified in Table I of Appendix II.B-1 as Group 5 (TEG Water) and Group 6 (DEG Water).

The Group 5 and Group 6 wastes may not be treated at the ~~open burning ground~~OBG.

#### II.B. ~~2b~~2c. Load, Assemble, and Pack Waste

The load, assemble, and pack waste consists of ~~E~~energetic wastes ~~is~~ generated when ~~ammunition~~ cartridges are assembled. The waste consists of materials that are placed in the cartridges such as HMX, RDX, and propellants. These wastes are identified in ~~Appendix II.B-1, Table 4-I~~ Appendix II.B-1, Table 4-I as Group 15.

The finished products from the load, assemble, and pack operations, including the off-specification projectiles that contain energetic materials, cases with primers, and primers may not be burned at the ~~open burning ground~~OBG.

II.B. ~~2e~~2d. Specialty Products Waste

The specialty products waste ~~Groups~~groups (17, 18, and 19) contain ~~propellant energetic materials such as with~~nitrocellulose, nitrate esters, nitroguanidine, solid explosives, and 40 CFR 261, Appendix VIII constituents ~~and are generated in small quantities~~. The specialty products wastes identified as Group 18 on Table ~~4~~ I of Appendix II.B-1 also contain chlorides or perchlorates. The specialty products wastes identified as Group 19 on Table ~~4~~I of Appendix II.B-1 contain metals in addition to the other materials contained in specialty product wastes. ~~The volume of specialty product waste is less than 5,000 pounds per year.~~

II.B. ~~2d~~2e. Miscellaneous Wastes

The miscellaneous wastes listed in Table I of Appendix II.B-1 include:

- a) Ignitable and reactive liquids in sawdust
- b) Propellant laboratory waste;
- c) Waste nitrocellulose; and
- ~~b)d)~~ ~~Off specification~~ Dinitrotoluene, ~~t~~Trinitrotoluene, and ~~Isotriol~~isotriol wastes from manufacturing that are not listed wastes.

The term ignitable and reactive liquids in sawdust refers to ~~a~~wastes containing a nitrate ester (any liquid explosive, *i.e.*, nitrogly~~cerine~~cerine, diethylene glycol dinitrate), triacetin, acetone, alcohol, or ether, and sawdust. The ignitable or reactive liquids with sawdust typically originate from cleaning operations or spills in the production area. ~~Triacetin is used to desensitize the reactive liquids. These wastes are identified as Group 1 wastes.~~

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The propellant laboratory waste included in Group 2 consists of waste materials from quality assurance and quality control testing. The propellant laboratory waste is a variable mixture of reactive materials and reagent chemicals used to perform laboratory analysis. The Group 2 wastes may not be burned at the ~~open burning ground~~OBG.

Waste nitrocellulose is non-reusable scrap from production operations, and scrap from the nitrocellulose dehydrating press operations. All such nitrocellulose is generally accumulated in a water-wet state. In the water-wet state this material is not reactive. These wastes, which are classified as Group 3 wastes, are not hazardous. The Group 3 wastes may not be burned at the ~~open burning ground~~OBG.

~~Off specification dinitrotoluene may result from the manufacture of commercial Dinitrotoluene, Trinitrotoluene, and Isotriol at the facility.~~

II.B.2e2f. Screening and Floor Wastes

The wastes in Group 20 are a combination of materials from Groups 1 through 19, excluding Groups 2, 3, 5, and 6. These include solids screening pit waste from production building wash downs, floor sweepings from production buildings that could potentially be contaminated with metal, rocks or other foreign object debris (FOD) that could cause an explosion at the Incinerator Grinder building.

Because these wastes are a combination of many different waste groups, there is not one simple characterization that adequately describes them. Therefore, they are not included on Table II of Appendix II.B-1. ~~The screening and floor waste group does not consist of specific constituents included in Table 2 and is therefore, not represented on Table 2. Waste Group 20 is a combination of materials from Waste Groups 1 through 19, excluding 2, 3, 5, and 6. The Group 20 wastes do not~~ It does not include any listed wastes nor does it ~~exceed any of the limitations on specific constituents set forth in Module III of this permit~~ carry any RCRA codes not authorized by this Permit.

II.B.3. Waste ~~Storage~~ Accumulation and Handling

Waste materials from the 20 waste ~~Groups~~ groups that are to be treated at the ~~OB Ground~~ burned open burning ground OBG are ~~stored~~ managed in less than 90-day ~~storage~~ accumulation buildings throughout the RFAAP in 20- gallon tubs. These tubs of waste are ~~retrieved by operators and~~ transported to the ~~Open Burning Grounds~~ open burning ground OBG, where they are prepared for open burning. The frequency of pickup varies according to production schedules, occurring as often as daily, however in most cases weekly. All hazardous waste is retrieved or burned, at a minimum, before the 90-day accumulation period expires.

Each container of waste managed at the ~~open burning grounds~~ OBG is accompanied by an internal manifest sheet that documents the generator of the waste (the Permittee; or a RFAAP tenant organization, ~~or the NRU~~), the point of origin of the waste, the specific type of waste (e.g., type of energetic or waste mixture), and the date on which the waste was generated. Prior to transporting the waste to the ~~burning grounds~~ OBG, the waste handler inspects the waste to ensure that it matches the characterization provided on the internal manifest form and to make sure that it fits into one of the waste groups permitted for treatment at the ~~open burning ground~~ OBG.

II.B.4. Waste and Residue Sampling

Alliant Ammunition and Powder Company, LLC/BAE/OSI, the permitted operator of the treatment and storage facilities, has prepared a waste sampling plan to help ensure collection of representative samples for analysis. The intent of the sampling plan is to provide representative data to maintain compliance with solid and hazardous waste regulations. All sampling will be conducted in accordance with the facility's sampling and analysis plan and maintained as part of the Facility Operating Record. Two types of sampling are conducted to comply with this Permit: waste sampling and residue sampling. This section provides a description of the techniques employed for both.

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#### II.B.4.a Waste Sampling

~~\_\_\_\_\_~~ Samples for characterizing the managed wastes are collected on a daily basis as the wastes are loaded into the pans ~~\_\_\_\_\_~~ Monday through Friday during the daylight shift, as waste is loaded onto the ~~\_\_\_\_\_~~ trolley conveyor in preparation to be ground and incinerated. The operator ~~\_\_\_\_\_~~ collects grab samples from tubs of each waste group that is being processed. The ~~\_\_\_\_\_~~ grab samples are collected into separate sample containers for each group. Each ~~\_\_\_\_\_~~ sample container is labeled with the month, the group number or propellant type, ~~\_\_\_\_\_~~ the "composite" notation for sample type, and the sampler's initials. At the end of ~~\_\_\_\_\_~~ the month, the operator splits the composite sample for one of the waste groups ~~\_\_\_\_\_~~ and numbers the container (this is done to generate a duplicate sample for quality ~~\_\_\_\_\_~~ assurance and quality control). A sample number is then affixed to each container ~~\_\_\_\_\_~~ and the samples are sent to the laboratory for analysis as required to comply with ~~\_\_\_\_\_~~ this Permit.

Comment [RFAAP6]: Revised description to be more consistent with procedures currently in place.

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~~Grab samples are collected daily into separate sample bags or jars for each Group received at the OB Ground. The daily grab samples are composited into one sample for each Group for each month. Each sample bag or jar is labeled with the date, the waste group, the propellant type, the "composite" notation for sample type, the sample number, and the sampler's initials.~~

~~The daily grab and monthly composite samples are collected throughout the month for each of the 20 Groups and are stored in the Grinder Building in an area designated for samples. At the end of the month, the operator splits the composite sample for one of the waste Groups. Both of these samples are sent to the laboratory with the other waste Group composite samples to be analyzed for the month. This duplicate sample provides quality assurance/quality control information on the analysis technologies. The composite samples are analyzed as described in Section II.B.5, Waste Analysis Requirements. All samples will be stored in the Grinder Building. To ensure that proper sampling technique is employed, all operators that collect samples of the waste streams will be trained in the sample collection procedure during their initial on-the-job training.~~

#### II.B.4b. Residue Sampling

The primary hazard characteristic of the waste residue after thermal treatment will originate from heavy metals and possible traces of the waste material. All of the waste residues from burning, cleaning of the burn pans and collection of precipitation that collects in the burn pans are containerized and handled as hazardous waste. Wastes that are verified as being hazardous are then disposed of in a permitted hazardous waste disposal facility. After treatment, the immediate area surrounding the unit is inspected and unburned explosives are collected and



held until the next scheduled burn. This procedure ensures that any waste treatment residues collected for analysis and disposal are not of an explosive nature.

#### II.B.5. Waste Analysis Requirements

All hazardous wastes managed in accordance with the facility's Permit will be subjected to waste analysis pursuant to the Permit and this Waste Analysis Plan prior to being ~~stored or treated at the permitted treatment and storage areas~~~~open burning ground~~ OBG. The Permittee maintains the responsibility for sampling and analyzing all wastes managed at the ~~burning grounds~~ OBG regardless of whether it was generated by the Permittee; or a RFAAP tenant organization; ~~or the NRU.~~

For each solid or hazardous waste ~~which that~~ may be ~~used as a slurry component~~~~open burned~~ (see Section II.B.2.) ~~for open burning~~, a hazardous waste determination will be made in accordance with 9 VAC 20-60-262, adopting 40 CFR 262.11 by reference. At a minimum, the determination will identify:

- i. Whether the waste is radioactive,
- ii. Whether the waste is listed under 9 VAC 20-60-261, adopting 40 CFR 261 Subpart D by reference; and
- iii. Whether the waste is a characteristic hazardous waste in accordance with 9 VAC-20-60-261, adopting 40 CFR 261.20 through 261.24 by reference.

This determination may be made through a combination of process knowledge and laboratory analysis. The results of all hazardous waste determinations will be maintained in the ~~Facility~~ facility ~~Operating~~ operating ~~Record~~ record.

In addition to the hazardous waste determination for each waste ~~Group~~ group, all wastes ~~stored or treated~~ managed at the facility are tested for compatibility with nitroglycerin (NG) and nitratibility when they are first generated. ~~Compatibility on a daily basis is not of concern, as compatibility with other materials is addressed upon generation of the material.~~

~~The~~ Compatibility testing is performed utilizing a multi-test apparatus methodology, which, when completed, provides the data necessary to determine the compatibility of waste ~~Groups~~ groups. Compatibility is based on the amount of gas produced by the mixture of explosive and contact material that is in excess of the amount of gas produced by the materials themselves. ~~Test criteria establishes~~ The wastes are deemed "incompatible" ~~if~~ as a mixed sample of the wastes ~~which~~ generates a specific volume of gas more than the sum of the associated unmixed specimens. Compatibility tests are performed by the ~~on site~~ site laboratory.

Once this initial compatibility testing is completed, no further compatibility analysis is performed while the wastes is being generated.

II.B.5a. Analysis of Waste Groups

All waste ~~Groups~~ groups are analyzed to determine a profile for the ~~Group~~group, and to determine compliance with ~~feed rate limits for~~ the OB-~~Ground~~ permit limits. These two types of analyses are described in more detail below.

Waste Profiling Analysis

At all times an accurate profile of every hazardous waste open burned at the ~~permitted treatment and storage areas~~RFAAP will be maintained in the ~~Facility~~ facility ~~Operating-operating Record~~record. A hazardous waste profile will identify the hazardous constituents and characteristics necessary for proper designation and management of the waste stream. The profile will also include concentrations of all 40 CFR 261 Appendix VIII (adopted by reference in 9 VAC 20-60-261) constituents in that waste.

Each hazardous waste profile will include or consist of:

- a. Existing published or documented data on the hazardous waste or on waste generated from similar processes. The use of existing published or documented data will include confirmation by the generator that the process generating the hazardous waste has not significantly changed; and/or
- b. Laboratory analysis of the waste stream consisting of chemical, physical, and/or biological analyses using appropriate ~~tests~~ methods from the EPA document SW-846 Test Methods for Evaluating Solid Waste, 3rd Edition, 1986, as updated, or by facility standard operating methods that ~~achieve the performance specifications specified in the equivalent SW-846 method~~have been approved via the Virginia Environmental Laboratory Accreditation Program.

Every waste profile will be reviewed at least annually in order to confirm that it still accurately represents the waste stream. A waste stream will be re-profiled whenever the Permittees have reason to believe that the process or operation generating the hazardous waste has changed.

Analysis for Compliance with Open Burning Permit Conditions

In order to assure compliance with the waste feed requirements of the facility's RCRA Permit, the composition of each waste Group to be open burned will be determined from ~~1) the generator's knowledge of waste compositions provided in Appendix II.B-1, Table 2 and 2) analysis of samples collected daily and~~

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composited monthly at the Grinder Building by OB-Ground personnel. The concentration of the constituents listed below will be determined through analysis:

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- Aluminum
- Barium
- Chromium
- Lead
- Chloride (total chlorine and perchlorate, expressed as chloride equivalents)

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The concentration of the constituents will be determined by the site-specific analytical methods specified below. Each method has been reviewed by the Virginia Department of Laboratory Services and is accredited under the Virginia Environmental Laboratory Accreditation Program.:

i. ~~The ash concentration will be determined using the method specified in Appendix II-B-1.~~

Comment [RFAAP7]: Removed, as this is not a relevant parameter for compliance with the OBG permit (it is an artifact from the EWI permit)

i. The concentration of chlorine and perchlorate in the waste stream will be determined by RFAAP Procedure No. VELAP-02.

ii. The concentration of metal compounds will be determined using SW-846 Method 7000A or the most current version of the method for each analyte. Alternatively, metal compound concentrations may be determined using the RFAAP Laboratory test methods as specified in Table 3. RFAAP Procedure No. VELAP-04. Note: Not all of the constituents listed in Table 3 are required to be sampled.

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iii. Samples for metals analysis shall will be prepared using RFAAP Laboratory nitric acid reflux method digestion method as described in Table 4. Procedure No. VELAP-03.

Analytical results below the method detection limit (MDL) will be considered analytical non-detects and recorded at one-half the full method detection limit.

#### II.B.5b. Analysis of Waste Residues and Other Materials

After completion of each burn, any ash left in the burn pan After each burn, the ash is placed in a 20-cubic yard roll-off container-55-gallon drum located at the OB-Ground. Composite samples of the ash from each drum are collected as the ash is generated and are analyzed onsite approximately every 60- days to determine if it exhibits the hazardous characteristics of reactivity. Reactivity analysis are conducted using the procedures provided in Appendix II-B.2. In addition, on an annual basis, SW-846 Method 1311 is used to determine if the

waste meets the toxicity criteria via the Toxicity Characteristic Leaching Procedure (TCLP).

If the ash exhibits ~~a~~ the characteristic of reactivity it will be removed from the container and placed back on the pans at the ~~Open-open Burning-burning-Ground ground~~ OBG for further treatment. If the ash does not exhibit ~~a~~ the characteristic ~~for~~ of reactivity but is otherwise determined to be a hazardous waste according to 9 VAC 20-60-261.24, then it will be managed as a hazardous waste in accordance with all applicable requirements of 9 VAC 20-60. If the ash is not determined to be a ~~does not exhibit a characteristic of a~~ hazardous waste it will be managed as a solid waste in accordance with all applicable requirements of 9 VAC 20-80-10 *et seq.*

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In addition to satisfying requirements for disposal and shipping of the waste, the results of the reactivity analyses are maintained to demonstrate compliance with 9 VAC 20-60-1010.K.8, which requires the facility to provide a demonstration of the effectiveness of the thermal treatment process.

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#### II.B.5c. Quality Assurance and Quality Control

All sampling and analyses performed in accordance with this Waste Analysis Plan will, at a minimum, achieve all performance specifications specified in the ~~equivalent SW-846 methods or the~~ VELAP-approved ~~RFAAP site-specific analytical method and quality assurance manual approved by the Virginia Environmental Laboratory Accreditation program and Tables 4-7, as appropriate.~~ Records of the specific analytical method used ~~s utilized from SW-846 or standard facility operating methods and procedures~~ and appropriate QA/QC documentation will be maintained at RFAAP with the results of all analyses.

~~II.B.7 — Chemical and Physical Analyses [40 CFR 270.14(b)(2) and 264.13(a)]~~

~~Chemical and Physical Analyses for wastes treated at the OB Ground are discussed in Section II.B.5.~~

**Comment [RFAAP8]:** Removed as these sections were either duplicative of previous sections or not applicable to the open burning ground.

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~~II.B.7(a) — Containerized Waste [40 CFR 270.15(b)(1)]~~

~~Containerized waste associated with the OB Ground is discussed in Section II.B.3.~~

~~II.B.7(b) — Waste in Piles [40 CFR 264.250(c)(1) and (4)]~~

~~There are no RCRA waste piles associated with the RFAAP OB Ground.~~

~~II.B.7(c) — Landfilled Wastes [40 CFR 264.314]~~

~~There are no RCRA landfilled wastes associated with the OB Ground. Ash determined hazardous from the treatment of waste at the miscellaneous units OB Ground is sent to a permitted RCRA disposal facility or retreated in the OB Ground if only determined to be hazardous for the reactivity characteristic.~~

~~II.B.7(d) — Wastes to be Land Treated [40 CFR 270.20(b)(4), and (2)]~~

~~There are no RCRA wastes to be land treated in association with RFAAP's OB Ground.~~

~~II.B.7(e) — Miscellaneous Thermal Treatment of Wastes [40 CFR 270.23]~~

~~The OB Ground has analyzed each shipment of residue for many years. Originally each shipment was tested using the Gap Test as described in Appendix II.B.2. The residue never was reactive. In the past 2 years the residue has been analyzed by the on site laboratory for propellant. Hazards Analysis then reviews the data and by knowing that less than 10% propellant in the residue will not result in a reactive waste the waste is deemed not reactive. The residue comes back at less than 1% propellant. This demonstrates the effectiveness of the OB Ground operations.~~

**Comment [RFAAP9]:** Moved material from this section to other portions of the WAP and removed duplication.

~~The waste streams include the same raw material as the usable items production materials generated at the RFAAP but do not meet some performance specification. When this is the case, the same conclusions can be drawn regarding the appropriate treatment based on published data. This information is reviewed and if there is a question as to the suitability of a particular waste for OB, other data is gathered to resolve the issue. A small test burn of this material, if possible, may provide adequate information on the applicability of OB for this waste. A test burn may also be appropriate to determine acceptability of OB on materials for which little or no historical data exists. It is not feasible in the aforementioned~~

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cases to do a complete chemical analysis of the material in question because of its presumed hazardous nature.

Information to ensure safe handling of materials to be thermally treated at the OB Ground is available in historical data and ordnance publications. In the case of materials that have no such information, chemical and physical analyses are performed to determine its reactivity, stability, and ignitability characteristics. These guidelines are provided in the waste analysis plan contained in this permit application. No waste materials are stored at the OB site. They are transported to the site directly from the production plant or from established <90 day accumulation areas.

Under no circumstances is any material contaminated with or suspected of being contaminated with military warfare agents accepted for thermal treatment at the OB unit. Examples of such chemical warfare agents are:

- \_\_\_\_\_ Choking agents
- \_\_\_\_\_ Nerve agents
- \_\_\_\_\_ Blood agents
- \_\_\_\_\_ Blister agents
- \_\_\_\_\_ Incapacitating agents
- \_\_\_\_\_ Vomiting compounds
- \_\_\_\_\_ Tear producing compounds
- \_\_\_\_\_ Herbicides

Another class of compounds that will not be treated at the OB Ground are smoke and incendiary devices. These compounds either will not be successfully treated by this process or are violently reactive to the point of being a severe health hazard are not suitable for treatment at the OB Ground for a variety of reasons.

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All of the waste accepted for thermal treatment at the OB Ground is considered hazardous prior to treatment because of its explosive, reactive, or flammable nature or because it meets RCRA toxicity thresholds for certain compounds. Full hazard characteristics analyses are not performed prior to open burning to avoid danger associated with excess handling of such materials and to eliminate costly and potentially dangerous time delays. The waste is visually inspected prior to treatment to ensure that only appropriate wastes are subjected to thermal treatment. Non-explosive wastes are returned to the main plant.

The primary hazard characteristic of the waste residue after thermal treatment will originate from heavy metals and possible traces of the waste material. All of the waste residues from burning, cleaning of the burn pans and collection of precipitation that collects in the burn pans are containerized and handled as hazardous waste. They are stored onsite, and are sampled and analyzed in accordance with the hazardous waste analysis plan contained in this document and

~~in accordance with 40 CFR 264. Wastes that are verified as being hazardous are then disposed of in a permitted hazardous waste disposal facility. After treatment, the immediate area surrounding the unit is inspected and unburned explosives are collected and held until the next scheduled burn. This procedure ensures that any waste treatment residues collected for analysis and disposal are not of an explosive nature. Scrap metal fragments are collected and disposed of in accordance with applicable DOD and environmental regulations.~~

~~II.B.8 Waste Analysis Plan [40 CFR 270.14(b)(3), 264.13(b)(c)]~~

~~The Waste Analysis Plan for the OB Ground was presented at the begininig of this section.~~

**Comment [RFAAP10]:** Removed these sections as they are either duplicative of previous sections or not applicable to the open burning ground

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~~II.B.8(a) Parameters and Rationale [40 CFR 264.13(b)(1)]~~

~~The parameters and rationale of the Waste Analysis Plan are described in Section II.B.1.~~

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~~II.B.8(b) Test Methods [40 CFR 264.13(b)(2)]~~

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~~Test procedures of the Waste Analysis Plan are described in Section II.B.5.~~

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~~II.B.8(c) Sampling Methods [40 CFR 264.13(b)(3) and Part 261, App. I]~~

~~Sampling Methods of the Waste Analysis Plan are discussed in Section II.B.4.~~

~~II.B.8(d) Frequency of Analysis [40 CFR 264.13(b)(4)]~~

~~Sampling Methods of the Waste Analysis Plan are discussed in Section II.B.4.~~

~~II.B.8(e) Additional Requirements for Ignitable, Reactive or Incompatible Wastes  
[40 CFR 264.13(b)(6), 264.17]~~

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~~Additional requirements for ignitable, reactive or incompatible wastes are described in Section  
II.B.5 of the Waste Analysis Plan.~~

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**TABLE 3****SUMMARY OF ANALYTICAL METHODS**

**Comment [RFAAP11]:** Removed this table as it is duplicated in the text above.

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Analyte	<del>SW 846 Method Number</del> <sup>1</sup> <del>RFAAP Method Number</del>
Sample preparation	<del>RFAAP Laboratory Nitric Acid Reflux Digestion Method</del> <sup>1</sup>
Antimony	7040
Thallium	7840
Lead	7420
Cadmium	7130
Nickel	7520
Silver	7760A
Chromium	7190
Beryllium	7090
Barium	7080A
Selenium	7742
Mercury	7470A/7471A or RFAAP Laboratory Varian Cold Vapor AA <sup>2</sup>
Arsenic	7062
Ash	RFAAP Laboratory Gravimetric Method <sup>3</sup>
Chloride	RFAAP Laboratory Anion Chromatography Method <sup>4</sup>
Perchlorate	RFAAP Laboratory Anion Chromatography Method <sup>5</sup>

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<sup>1</sup>—All methods have been reviewed and approved by the Virginia Environmental Laboratory Accreditation Program.

<sup>1</sup>—Method description provided in Table 4

<sup>2</sup>—Method description and QA criteria provided in Table 5

<sup>3</sup>—Method description provided Appendix II.B-1

<sup>4</sup>—Method description and QA criteria provided in Table 6

<sup>5</sup>—Method description and QA criteria provided in Table 7

**TABLE 4**

**METHOD DESCRIPTION FOR SAMPLE DIGESTION**

**Comment [RFAAP12]:** Removed each of these as we now have SOPs and VELAP approval of those SOPs. Inclusion of the methods in this Permit should not be necessary.

Method for Digestion of waste propellants prior to metals analyses

~~SW-846 Method 3050B shall be followed with the exception of the variations noted below:~~

- ~~• Weigh 20 g of sample~~
- ~~• Add 160 ml nitric acid~~
- ~~• Bring to reflux slowly~~
- ~~• Reflux overnight~~
- ~~• Add nitric acid to make 200 ml total volume~~
- ~~• Filter~~

**TABLE 5****METHOD DESCRIPTION AND QA CRITERIA FOR MERCURY**

**Comment [RFAAP13]:** Removed each of these as we now have SOPs and VELAP approval of those SOPs. Inclusion of the methods in this Permit should not be necessary.

Method for determining ~~mercury~~ in waste propellants via Varian cold vapor AA

SW 846 Method 7470A/7471A shall be followed with the exception of the variations noted below:

- Weigh 10 g of sample into ST Erlenmeyer flask (typically 24/40 250 ml)
- Add 80 ml nitric acid
- Bring to reflux slowly under ST Friedrich condenser
- Reflux overnight
- Cool
- Transfer with nitric acid washing to make 100ml total volume in volumetric flask
- Filter through Whatman #41 paper.
- Dilute 1 to 10 with 5% nitric acid containing 0.01% potassium dichromate.

Conditions for Varian AA: Cold-vapor

INSTRUMENT \_\_\_\_\_ Varian

WAVELENGTH NM \_\_\_\_\_ 253.7

SLIT NM \_\_\_\_\_ 0.5

MILLIAMPS \_\_\_\_\_ 10

BC (ON/OFF) \_\_\_\_\_ OFF

STANDARDS \_\_\_\_\_ 5,10,15,20 ppb mercury

BLANK MATRIX \_\_\_\_\_ 5% NITRIC ACID, 0.01%  $K_2Cr_2O_7$

STD MATRIX \_\_\_\_\_ 5% NITRIC ACID, 0.01%  $K_2Cr_2O_7$

Method QA shall be conducted as specified below:

QA Provision	Definition	Criterion
Calibration Curve Correlation	Correlation to least squares fit	0.995 minimum
Continuing Calibration Verification	Recovery of independent source of standard at midrange of curve performed every 20 samples	75% to 125%
Spiked Samples	Recovery of known concentration of analyte is determined every 20 samples	75% to 125%
Duplicate Sample	Reproducibility of duplicate samples is determined every 20 samples	No formal criteria for rejection because of inhomogeneity of samples
Blanks	Spectrophotometric absorbance of reagents without analyte is determined	Used to determine MDL and MQL and deducted from the sample absorbances to compensate for drift
Minimum Detection Limit (MDL)	3-times the standard deviation of the blank divided by the slope of the calibration curve	Consistent with literature and previous performance of instrument
Minimum Quantitation Limit (MQL)	5-times the standard deviation of the blank divided by the slope of the calibration curve	Consistent with literature and previous performance of instrument

**TABLE 6**

**QA CRITERIA FOR ASH\***

**Comment [RFAAP14]:** Removed each of these as we now have SOPs and VELAP approval of those SOPs. Inclusion of the methods in this Permit should not be necessary.

QA Provision	Definition	Criterion
Duplicate Sample	Reproducibility of duplicate samples is determined every 20 samples	No formal criteria for rejection because of inhomogeneity of samples
Blanks	Weight change of empty crucible is determined	Used to determine MDL and MQL
Minimum Detection Limit (MDL)	3-times the standard deviation of the blank determined during method development	Consistent previous performance and balance capabilities
Minimum Quantitation Limit (MQL)	5-times the standard deviation of the blank determined during method development	Consistent previous performance and balance capabilities

\* See Appendix II.B-1 for description of method.

**TABLE 7**

**METHOD DESCRIPTIONS AND QA CRITERIA FOR  
CHLORIDE AND PERCHLORATE**

**Comment [RFAAP15]:** Removed each of these as we now have SOPs and VELAP approval of those SOPs. Inclusion of the methods in this Permit should not be necessary.

Anion Chromatographic method for determining **chloride** in waste propellants

SW-846 Method 9057 shall be followed with the exception of the variations noted below:

- Dissolve 1g of waste in 50 ml acetonitrile. (Typically in volumetric flask 250 ml using magnetic stirring over night)
- Add DI water for total volume of 250 ml. Mix thoroughly with shaking and flask inversions.
- Centrifuge a portion (about 20 ml) to remove precipitated organics (polymers) (note: allowing mixture to settle overnight and decanting makes this step easier.)
- Prepare 3M Empore 2240 47mm SDB-XC extraction disk with sequential 10 ml acetone, isopropanol, methanol, and water rinses.
- Filter decanted sample through Extraction disk.
- Dionex IonPac guard and analytical columns (AG16 4X50 and AS16 4X250 mm, respectively).
- Eluent 12 mM KOH or minimum concentration needed for desired separation.
- Eluent flow nominally 1 ml/min.
- Retention time of chloride anion 6-7 minutes is typical.
- Standards nominally 5, 10, 20, 30, 40, 50 ppm Cl.

Anion Chromatographic method for determining **perchlorate** in waste propellants (very similar to chloride method above)

SW-846 Method 9058 shall be followed with the exception of the variations noted below:

- Dissolve 1g of waste in 50 ml acetonitrile.
- Add DI water for total volume of 250 ml.
- Centrifuge.
- Prepare 3M Empore 2240 47mm SDB-XC extraction disk with sequential 10 ml acetone, isopropanol, methanol, and water rinses.
- Filter decanted sample through Extraction disk.
- Dionex IonPac guard and analytical columns (AG16 4X50 and AS16 4X250 mm, respectively).
- Eluent 45mM KOH, or minimum concentration required for desired separation.
- Eluent flow nominally 0.9 ml/min.
- Perchlorate retention time 12 to 13 min.
- Standards nominally 10, 50, 150, 200, 250, 500 ppm ClO<sub>4</sub>.
- Calculate and report data as chlorine concentration

**TABLE 7 (cont.)**

Method QA shall be conducted as specified below:

QA Provision	Definition	Criterion
Calibration Curve Correlation	Correlation to least squares fit	0.995 minimum
Continuing Calibration Verification	Recovery of independent source of standard at midrange of curve performed every 20 samples	75% to 125%
Spiked Samples	Recovery of known concentration of analyte is determined every 20 samples	75% to 125%
Duplicate Sample	Reproducibility of duplicate samples is determined every 20 samples	No formal criteria for rejection because of inhomogeneity of samples
Blanks	Concentration of reagents without analyte is determined	Used to determine that contamination has not occurred
Minimum Detection Limit (MDL)	1 ppm chloride in prepared sample	Consistent with literature and previous performance of instrument
Minimum Quantitation Limit (MQL)	3 ppm chloride in prepared sample	Consistent with literature and previous performance of instrument



Appendix II.B-1

~~Ash Determination Method~~Waste Group Composition Data

**Comment [RFAAP16]:** Removed this appendix as we now have SOPs and VELAP approval of those SOPs. Inclusion of the methods in this Permit should not be necessary.

Renumberd appendices as appropriate.



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TABLE I

WASTE GROUPS MANAGED AT THE RFAAP <sup>1</sup>

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Group No.	Description	Defining Characteristics	RCRA Waste Codes <sup>2</sup>
1	Miscellaneous Waste	Ignitable and reactive liquids and sawdust	D001, D003
2	Miscellaneous Waste	Propellant Laboratory Waste	D001, D003, D004-D011, D030
3	Miscellaneous Waste	Waste Nitrocellulose Solid Waste	N/A
4	Miscellaneous Waste	Dinitrotoluene and Trinitrotoluene Wastes from manufacturing that are not listed wastes	D003, D030
5	Liquid Waste	Water Containing Triethylene Glycol Solid Waste	N/A
6	Liquid Waste	Water Containing Diethylene Glycol Solid Waste	N/A
7	Single Base Propellants	Propellant with Nitrocellulose and Lead	D001, D003, D008
8	Single Base Propellants	Propellant with Nitrocellulose	D001, D003
9	Single Base Propellants	Propellant with Nitrocellulose and Dinitrotoluene	D001, D003, D030
10	Double Base Propellants	Propellant with Nitrocellulose and Nitrate Esters	D001, D003
11	Double Base Propellants	Propellant with Nitrocellulose, Nitrate Esters and Perchlorate salts	D001, D003
12	Double Base Propellants	Propellant with Nitrocellulose, Nitrate Esters and Lead	D001, D003, D008
13	Energetics with solid explosives	Propellant with Nitrocellulose, Nitrate Esters or Solid Explosives	D001, D003
14	Triple Base Propellants	Propellant with Nitrocellulose, Nitrate Esters and Nitroguanidine	D001, D003
15	Load, Assemble, & Pack Waste	Energetic materials from manufacturing cartridges	D001, D003
16	Single Base Propellants	Propellant with Nitrocellulose, Dinitrotoluene, and/or Lead	D001, D003, D008, D030
17	Specialty Products Waste	Energetics with Nitrocellulose, Nitrate Esters, Nitroguanidine, Solid Explosives, or Appendix VIII <sup>3</sup> Constituents	D001, D003, D004-D010, D030
18	Specialty Products Waste	Energetics with Nitrocellulose, Nitrate Esters, Nitroguanidine, Solid Explosives, and Appendix VIII Constituents, Chlorides, or Perchlorates	D001, D003, D004-D010, D030
19	Specialty Products Waste	Energetics with Nitrocellulose, Nitrate Esters, Nitroguanidine, Solid Explosives, and Appendix VIII Constituents, or Metals	D001, D003, D004-D010, D030
20	Screening and Floor Wastes	Solids screening pit waste from production building wash downs, floor sweepings from production buildings that could potentially be contaminated with metal, rocks or other FOD that could cause an explosion at the Incinerator Grinder building.	D001, D003, D004-D011, D030

1. Note that those wastes from Groups 2, 3, 5, and 6 are not treated at the open burning ground OBG.

2. Codes shown represent those RCRA waste codes that the waste may exhibit. Not all of the specified codes may apply to every canister of waste treated within this group.

3. 40 CFR 261, Appendix VIII

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~~Appendix BB-2 from Sept. 2000 permit appl.~~

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**Appendix II.B-2**

**Reactivity Test Methods**

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~~Appendix BB-3 from Sept. 2000 permit ap~~  
II.B App II.B-2 Reactivity Test Method

**ATTACHMENT II.G**

**CLOSURE PLAN**

**Comment [RFAAP1]:** Suggested revisions added June 2015 as part of the RCRA permit renewal application for the RFAAP open burning ground

**Comment [RFAAP2]:** Revised to be consistent with changes proposed in the EWI permit application

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## **ATTACHMENT II.G – CLOSURE PLAN**

The following text was excerpted from RFAAP's January 12, 2001 submittal excluding the incinerator. The original formatting and numbering scheme is retained in order to simplify

### **II.G.1. ~~1.0~~ — INTRODUCTION**

This Closure Plan has been prepared for the Open Burning Ground (herein referred to as the ~~OB Ground~~OBG), ~~permitted treatment unit~~, at the Radford Army Ammunition Plant (RFAAP). The ~~OB Ground~~OBG is a permitted treatment unit used for the treatment of hazardous waste generated onsite at the RFAAP by the owner, operator, and tenant operations. This section presents the purpose of the Closure Plan, background information on the RFAAP, and the ~~OB Ground~~OBG, and a summary of information contained within the Closure Plan.

#### **II.G.1a. ~~1.1~~ — Purpose**

This Closure Plan has been prepared for the facility as part of a Hazardous Waste Management Permit Application for the RFAAP. The purpose of the Closure Plan is to develop a closure strategy that assures the RFAAP will close the hazardous waste facilities in a manner that:

- (a) Minimizes the need for further maintenance; and
- (b) Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and
- (c) Complies with the closure requirements of 9 VAC 20-60-264, 40 CFR 264 Subpart G and 264.197 and 264.351.

#### **II.G.1b. ~~1.2~~ — Background**

This section provides a brief overview of the operations at RFAAP and those operations performed at the ~~OB Ground~~OBG.

##### **~~1.2.1~~ RFAAP Operations**

The RFAAP encompasses approximately 4,104 acres and is located in southwest Virginia within Pulaski and Montgomery Counties as shown in Figure II.G-1. ~~The RFAAP is located approximately 5 miles northeast of the City of Radford, 10 miles west of Blacksburg, and 47 miles southwest of Roanoke.~~ The New River separates Pulaski and Montgomery counties and also divides the RFAAP into two portions commonly known as the Horseshoe Area and Main Manufacturing Area. These two areas and the approximate boundary of the RFAAP are shown on the topographic map in Figure II.G-42.



The OBG is located in the southeast section of the Horseshoe Area on the northern bank of the New River as shown in Figure II.G-2 and is used for the open burning of waste propellant. Propellant wastes that cannot be safely treated in the onsite incinerators (e.g., those containing metal particles, rocks, and similar debris) are treated at the OBG. Figure II.G-3 shows the OBG boundary and the locations of the actual structures.

RFAAP is a government-owned, contractor-operated (GOCO) industrial installation responsible to the U.S. ~~Army Joint Munitions Command at Rock Island Arsenal whose Army.~~ The mission of the RFAAP is to manufacture propellants, explosives, and chemical materials as assigned. ~~The Alliant Powder and Ammunition Company, L.L.C. (Alliant) currently is the operator of the facility under a Facility Use contract.~~ As a GOCO operation, RFAAP has both ~~Government government~~ and ~~Contractor contractor~~ organizations. For the purpose of this permit application, the facility consists of all contiguous portions of the RFAAP ~~under the control of the either the U.S. Army or Alliant (permitees).~~ The facility specifically includes both the Horseshoe Area and the Main Manufacturing area. ~~Wastes from onsite activities (including those of both the operating contractor and government tenant operations) are managed at the OBG.~~

The facility was first constructed in 1940 and began operations producing smokeless powder (single base, double base and triple base propellants) in 1941. Since that time various processes/products have been added to the facility including production of cast propellants, trinitrotoluene (TNT), commercial propellants, and load, assemble and pack facilities. Specific operations vary based upon contracted capacity and products from the Department of Defense and U.S. allies.

### **1.2.2 OB Ground OBG Operations**

~~The OB Ground is located in the southeast section of the Horseshoe Area on the northern bank of the New River as shown in Figure 1 and is used for the open burning of waste propellant. Propellant wastes that cannot be safely treated in the Incinerator (metal particles, rocks, and similar debris in the waste may damage the grinder system) are treated at the OB Ground. Figure 2 shows the OB Ground boundary and the locations of the actual structures.~~

~~Operations-Equipment included as part of the OB Ground OBG include propellant waste transfer and treatment, the waste burn pans and covers and the remote ignition system. No permitted storage areas are present at the OBG area. Wastes are brought to the area immediately prior to being place in the pans of ignition. and equipment as follows:~~

- ~~Burning Pans and Covers~~
- ~~Remote Ignition System~~

Specific operations that are performed at the ~~OB Ground OBG include:~~ ~~are listed below.~~

- ~~1.~~ Waste materials are transported from production areas in <20 gallon containers to the ~~OB Ground OBG~~. The waste is then loaded into the burning pans.

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- ~~2.~~The burning pans are prepared for ignition by spreading the waste out ~~on each pan~~ and adding diesel fuel ~~and dunnage materials~~ if necessary.
- ~~3.~~The burning pans are remotely ignited.
- ~~4.~~Ash from the burning pans is collected and ~~accumulated onsite~~. The ash is staged ~~on-site~~ pending sample analysis and is then disposed offsite at a properly permitted disposal facility. ~~and disposal in a properly permitted disposal facility.~~

#### ~~II.G.1c. 1.3 Report Format~~

~~This Closure Plan contains the required information for a hazardous waste unit Closure Plan as identified in 9 VAC 20-60-264 and 40 CFR Part 264 Subpart G. The contents of this plan are as listed below.~~

- ~~Section 2 contains a summary of geologic, hydro geologic and hydraulic settings of the OB Ground.~~
- ~~Section 3 describes the types of hazardous wastes managed at the OB Ground.~~
- ~~Section 4 evaluates soil and groundwater impacts that are known to be or may be expected to be present at the OB Ground.~~
- ~~Section 5 contains a description of the general closure approach and objectives.~~
- ~~Section 6 presents the detailed closure approach and procedures.~~
- ~~Section 7 describes post closure care that may be required.~~
- ~~Section 8 presents the closure schedules.~~
- ~~Section 9 includes requirements for Closure Plan modification.~~

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## ~~II.G.2. 2.0 GeoLOGIC, HYDROGEOLOGIC AND hydrologic Summary~~

~~This section provides a summary of relevant physiographic, geologic, hydro-geologic and hydrologic conditions present at the RFAAP, the OB Ground.~~

### ~~II.G.2a. 2.1 General RFAAP Setting~~

~~The RFAAP is located within the Valley and Ridge Physiographic Province, which is part of the Appalachian Highlands. Elongated, narrow, ridges consisting of relatively resistant sandstones characterize this area and dolomites that strike southwest to northeast with narrow valleys of varying length and width between these ridges. This topography is the result of a complex sequence of thrust faulting and folding over the past 100 million years.~~

~~Sedimentary rocks consisting of limestone, dolomite, and minor sandstone underlie the Radford area. These rocks are complexly folded, faulted, and fractured. The RFAAP site is constructed above the Elbrook Formation, which is of the Cambrian Era and consists of dolomite, shale, and minor limestone. Typical features of this formation are sinkholes, solution channels, and a pinnacled bedrock surface. Surficial material consists of residual soils consisting primarily of silts and clays derived from the underlying rock. Alluvial deposits are also present along the banks of the New River and adjoining flood plain. These alluvial soils consist of micaceous silts and sandy clays underlain by coarser deposits of silty and clayey sands and gravel. Cobbles and boulders are scattered within the alluvial deposits.~~

~~Groundwater in the vicinity of the RFAAP occurs at relatively shallow depths in both soil and bedrock and is typically recharged by precipitation and stream flows. Groundwater in the terrace formations typically is found near the soil-bedrock interface. In flood plain areas, groundwater is typically present within the alluvial material. In the limestone and dolomite formations, groundwater is typically found in fractures and solution channels as is typical for such carbonate formations.~~

~~The New River flows through the RFAAP as shown on Figure 1. The river separates Pulaski and Montgomery counties and serves to divide the RFAAP facility into two distinct sections. Surface water flows generally drain to the New River with the exception of portions of the southeastern area of the plant. Surface water in this area flows to Stroubles Creek, which empties into the New River (Engineering Science, 1985; Commonwealth of Virginia, 1993).~~

### ~~II.G.2b. 2.2 OB Ground Conditions~~

~~The OB Ground is located approximately 70 to 150 feet north of the river at an approximate elevation of 1,695 feet MSL. The topography across the OB Ground is relatively flat; however, approximately 75 to 100 feet north of the OB Ground the ground surface slopes steeply upward. The elevation of the New River at the western~~

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~~end of the OB ground is approximately 1,680 feet MSL; the elevation of the New River at the eastern end of the OB Ground is approximately 1,676 feet MSL.~~

~~An approximately 13-20 feet thick alluvial deposit underlies the OB Ground. Based on a review of borehole logs for monitoring wells that were installed (by others) around the OB Ground, the alluvial deposit consists of clay and silt overlying sand and gravel. The alluvium appears to be laterally continuous across most of the site, although the thickness, composition, and texture vary between borehole/monitoring well locations.~~

~~Groundwater appears to be present at a depth of approximately 15 feet below ground surface.~~

~~Surface water runoff into the OB Ground is restricted by trenches. Surface water within the OB Ground is directed to a stormwater retention pond capable of handling a 25-yr storm. The pond overflows to the flat plain east of the OB Ground. The retention pond is in compliance with the VPDES permit for RFAAP.~~

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## II.G.2.

### ~~II.G.3.~~II.G.2.

## ~~3.0~~HAZARDOUS WASTE CHARACTERISTICS ANALYSIS

This section provides a general discussion of the types and sources of hazardous wastes managed at the ~~OB Ground~~OBG. This information includes the general types of wastes managed, specific waste streams, and maximum hazardous waste inventory.

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### ~~II.G.3a.~~II.G.2a.

## ~~3.1~~General Waste Types

**Comment [RFAAP4]:** Revised this section to be consistent with other portions of the application and the EWI permit application

The hazardous wastes that are ~~managed-treated (treated and stored)~~ at the permitted facility include waste ~~propellants-energetic materials~~ and spill "cleanup" residues generated at the facility. ~~These wastes which~~ are hazardous due to their ignitability (D001) and/or reactivity (D003). Additionally, some of the wastes may exhibit the toxicity characteristic for certain metals and/or 2,4-dinitrotoluene. A detailed description of the wastes is provided in the Waste Analysis Plan in Attachment II.B of this Permit.

~~Only hazardous wastes identified in the permit Waste Analysis Plan will be treated or stored at the Incinerator and/or treated at the OB Ground. These wastes include the following:~~

- ~~1. Wastes which exhibit only the following hazardous characteristic(s):~~
  - ~~a. Reactivity (hazardous waste number D003) as specified in 9 VAC 20-60-261; 40 CFR Part 261.23;~~
  - ~~b. Reactivity (hazardous waste number D003) as specified in 9 VAC 20-60-261; 40 CFR 261.23 and the characteristic of toxicity, as specified in 9 VAC 20-60-261; 40 CFR 261.24, for one of the following constituents:~~
    - ~~i. Lead (hazardous waste number D008);~~
    - ~~ii. 2,4 Dinitrotoluene (hazardous waste number D030); and/or~~
    - ~~iii. Barium (hazardous waste number D005)~~
  - ~~c. Ignitability (hazardous waste number D001) as specified in 9 VAC 20-60-261; 40 CFR 261.21. Ignitable wastes are limited to clean up residue of propellant ingredients. Ignitable wastes are mixed with sawdust and are not a liquid when brought to the permitted treatment and storage area.~~
- ~~2. Wastes which are not listed pursuant to 9 VAC 20-60-261; 40 CFR 261.31, 32, and 33; and~~
- ~~3. Wastes which are one of the following (as identified in the Waste Analysis Plan):~~
  - ~~a. Off specification propellants and propellant intermediates, generated at the facility;~~
  - ~~b. Liquid wastes, consisting of water and diethylene or triethylene glycol;~~
  - ~~c. Load, assemble and pack waste, consisting of energetic materials from assembling cartridges;~~

- d. ~~Specialty product wastes containing propellant with nitrocellulose, nitrate esters, nitroguanidine, solid explosives, and one of the following combinations of additional materials:~~
  - i. ~~40 CFR 261 Appendix VIII constituents (D003)~~
  - ii. ~~40 CFR 261 Appendix VIII constituents, chlorides and/or perchlorates (D003)~~
  - iii. ~~40 CFR 261 Appendix VIII constituents and/or metals (D003, D004-D010)~~
- e. ~~Other miscellaneous waste, described in Module II, Attachment II.B, Appendix II.B-1, Table I, as one of the following:~~
  - i. ~~Ignitable and reactive liquids in sawdust (D001, D003)~~
  - ii. ~~Propellant laboratory waste (D003, D008, D030, D004)~~
  - iii. ~~Pit cotton (Waste Nitrocellulose)~~
  - iv. ~~Off specification dinitrotoluene~~

### **~~II.G.3b.~~ II.G.2b. 3.2 Waste Composition**

The composition of the waste propellant mixtures ~~fed~~ burned at the ~~OB Ground~~ OBG varies over time due to changes in the production schedule at the RFAAP. Generally, these wastes include miscellaneous energetic wastes. For purposes of classification under RCRA, these wastes have been segregated into waste groups that differ based on their primary components and RCRA waste codes. There are no wastes managed in the permitted storage and treatment area that are incompatible with one another. Of those wastes discussed in the Waste Analysis Plan, those in Groups 2, 3, 5 and 6 are only treated in the incinerators; wastes from these groups may not be treated at the OBG. ~~Off-specification propellants and propellant intermediates, dinitrotoluene (including production intermediates), load, assemble and pack waste, specialty product waste and other miscellaneous wastes are the categories of wastes which may be treated at the OB Ground. These categories are segregated into 20 distinct waste groups, as listed in Table 2; all wastes with the exception of Groups 2,3, and the two liquid waste groups (Groups 5 and 6) containing triethylene glycol and diethylene glycol, may be treated at the OB Ground. No liquid wastes are treated at the OB Ground.~~

~~These waste streams are processed as described in Section 1.2.2 and are handled in accordance with the Waste Analysis Plan and the OB Ground operating procedures.~~

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### **~~II.G.2c. 3.3 OB Ground~~ OBG Maximum Hazardous Waste Inventory**

At any given point in time, the hazardous wastes present at the OBG may include those wastes scheduled for treatment that day and ~~The maximum inventory of hazardous waste that will be present at the OB Ground at the time of closure will be~~ the residue from burning the waste material. Given that wastes are only transferred to the OBG on the day they are scheduled for treatment, no actual hazardous production wastes are factored into the maximum quantity of waste for the closure calculations; only the residues from treatment are included. ~~Wastes are brought to the OB Ground each day and treated the same day as received.~~

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Based on historical ash generation and disposal records, the maximum amount of ash present at the burning ground at any point in time is estimated to be 30 drums at 400 pounds each, for a total ash quantity of 12,000 pounds. These residues, along with a

~~It is anticipated that prior to closure all remaining waste will be treated through the open burning process. Any wastes that remain at the RFAAP and have not yet been treated at the OBG and cannot otherwise be treated onsite, that are not capable of being treated will be disposed of at a properly permitted offsite facility, along with any ash resulting from this final treatment.~~

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**II.G.4.II.G.3. REVIEW OF POTENTIAL IMPACTS**

Comment [RFAAP5]: Updated this section based on new data that is available

This section contains a review of potential impacts to soil and groundwater in the permitted treatment and storage facilities as a result of hazardous waste management activities. These potential impacts will be evaluated and appropriately addressed as part of the closure activities.

**II.G.4a. 4.1 OB Ground****4.1.2 II.G.3a. Impacts to Soil**

In accordance with the EPA Corrective Action Permit, a Plant-wide Background Study was completed in September 2000. The soil samples collected during the Plant-wide Background Study were analyzed for all of the hazardous constituents listed in Appendix VIII of 40 CFR Part 261. The report on these analyses was submitted to and approved by the DEQ in May 2002. Since that time, additional soil sampling has been conducted as part of the RCRA soil monitoring program at the OBG. The results from this sampling are submitted to DEQ on a periodic basis. Data from these sampling events or another comprehensive and more recent event will be used in the evaluation of soils during closure. ~~The soils at the OB Ground were elevated in 1992 as part of a RCRA Facility Investigation. The results of the Facility Investigation were submitted to the EPA and VDEQ. In accordance with the EPA Corrective Action Permit, a Plant-wide Background Study was completed in September, 2000. The soil samples collected during the Plant-wide Background Study were analyzed for all of the hazardous constituents listed in Appendix VIII of 40 CFR Part 261. The analytical results for the Plant-wide Background Study were not yet available at the time of the Closure Plan.; however, the analytical results will be forwarded to the VDEQ when they become available. This data will be used in the evaluation of soils during OB Ground closure if it is deemed appropriate and current by the VDEQ at the time of actual closure. If the data is not acceptable to the VDEQ, alternative background sampling locations and analytical results will be submitted to the VDEQ for approval.~~

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**4.1.2 II.G.3b. Impacts to Groundwater**

Groundwater at the ~~OB Ground~~ OBG has been evaluated on a semiannual basis for potential impacts in accordance with the ~~Virginia Hazardous Waste Management Regulations (9 VAC 20-60-12 et seq.) and Title 40 of the Code of Federal Regulations, Part 265.93 (40 CFR 265.93)~~ OBG RCRA permit. This data and/or other groundwater information will be used in the evaluation of the groundwater during facility closure if it is deemed appropriate and current by the ~~VDEQ~~ DEQ at the time of actual closure. If the data is not acceptable to the ~~VDEQ~~ DEQ, alternative groundwater monitoring locations and/or analytical results will be submitted to the ~~VDEQ~~ DEQ for approval.



~~II.G.5.5.0 — General Closure Analysis~~  
**II.G.4. GENERAL CLOSURE ANALYSIS**

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This section presents the general goals and criteria for developing a closure strategy and developing criteria for closure. Feasible options for closure of the facilities are reviewed and evaluated with regard to regulatory requirements and environmental protection, economic feasibility, and practicality.

~~II.G.5a. II.G.4a.~~      **5.1 — General Closure Criteria**

As stated in the introduction, the purpose of the Closure Plan is to develop a closure strategy that assures the RFAAP will close the hazardous waste facilities in a manner that:

- (a) Minimizes the need for further maintenance; ~~and~~
- (b) Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and
- (c) Complies with the closure requirements of 9 VAC 20-60-264; 40 CFR 264 Subpart G, and 264.197 and 264.351.

RFAAP intends to remove all hazardous waste and all hazardous constituents at the ~~OB Ground~~OBG at the time of ~~closure (clean closure)~~closure. This will be accomplished by assessing samples against ~~cleaning to established~~ background standards ~~and/or, or by cleaning to risk-based standards if cleaning to background standards cannot be accomplished~~. The risk-based standards used will be those that are current at the time of closure. The risk assessment protocol to be used will be submitted for ~~VDEQ~~DEQ approval at the time of closure.

~~II.G.5b. II.G.4b.~~      **5.2 — Closure Alternatives**

Various alternatives are available for closure of the ~~OB Ground~~OBG. The various components of the facilities that will need to be addressed as part of the closure process include the physical structures included as part of the ~~OB Ground~~OBG as well as the soil and groundwater underlying these facilities.

**5.2.1 Closure Alternatives for Structures**

Comment [RFAAP6]: Changed this section to reflect determination of status at time of closure rather than presumed determination of status at this time.

Once hazardous waste treatment operations cease at the ~~OB Ground~~OBG it will be necessary to partially ~~or completely~~ close ~~or close the facilities~~OBG facility. The equipment included in this closure process will be the OBG pans, the pan covers, and the refractory clay lining in the pans. No other equipment is included in the waste management operations at the OBG. ~~as appropriate~~. Two basic options are available for closure ~~of these facilities~~of this equipment.

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First a hazardous waste contractor can dismantle the ~~equipment subject~~ pans and covers ~~to closure~~. The dismantled equipment can then be ~~containerized as a hazardous waste and shipped~~

~~off-site~~ for treatment/disposal. In this option, no hazardous waste determination would be made; the materials would just be assumed to be hazardous out of an abundance of caution. ~~A hazardous waste determination will need to be performed for each waste stream followed by the necessary waste characterization. Due to the types of wastes treated it is likely that much of the waste handling equipment would require handling as a hazardous waste.~~

The second closure option would require that the pans be disassembled (refractory removed) and the pans and covers ~~all waste handling equipment~~ be decontaminated. Once decontaminated the equipment can then be further dismantled and disposed of as non-hazardous solid waste or recycled as scrap material. This option will require greater ~~on-site~~ onsite management of decontamination fluids, wash water, decontamination verification, and overall management. However, overall costs should be significantly lower as the only hazardous waste generated that would require ~~off-site~~ off-site treatment or disposal would likely be the decontamination/wash water and pan refractory as opposed to significant quantities of contaminated debris as generated in the first option.

At a minimum, the potential for hazardous waste contamination in each of these pieces of equipment will be reviewed upon initiation in closure. In all likelihood, RFAAP will utilize the second of these options when disposing of the OBG equipment due to the smaller amount of hazardous waste generation/disposal and advantages of recycling the non-hazardous equipment (such as the decontaminated steel pans). The final decision on the disposition of the equipment will be provided to DEQ at the time of closure. If the second option is indeed selected as the primary means for management, appropriate sampling results will be provided to demonstrate the hazardous and/or non-hazardous characterization of each piece of equipment.

~~Based upon the economic advantages and potential for reduced quantities of hazardous wastes, RFAAP will decontaminate equipment to be closed prior to dismantling. The OB Ground burning pans and covers will be containerized prior to shipment off site and disposal of as hazardous waste; therefore, the pans and covers will not be decontaminated prior to disposal.~~

### 5.2.2 Closure Alternatives for Soil and Groundwater

Once the ~~closed structures~~ pans and covers have been ~~decontaminated~~ removed from the site, it will be necessary to address any potential impacts to soil and groundwater. The first step in this process will be to implement a sampling protocol to determine the following:

- ~~1.~~ If soils in the area of the ~~OB Ground~~ OBG have been ~~impacted~~ contaminated; and
- ~~2.~~ If any impacts that did occur have migrated through the soil to the uppermost aquifer.

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Once the extent of any impacts is determined, a closure approach for the soils and groundwater will be developed. ~~Four~~ Three basic closure options are available depending on the impacts encountered.:

- Option 1: If no impact to groundwater is encountered, pursue clean closure or risk-based closure for any contaminated soil impacts are feasible options.
- Option 2: If limited impact to groundwater is encountered, then removal of source material or "hot spots" and perform limited follow-on monitoring as appropriate.
- Option 3: followed by a period of monitoring may be appropriate. Finally, should If significant groundwater impact be is discovered, source remove source material and/or provide or control along with some means of groundwater treatment/containment may be necessary control.

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If there is no adverse impact to groundwater, RFAAP will pursue a clean closure option. However, the use of risk based closure for soils may be desirable if the quantity of soil requiring treatment is large enough to make clean closure economically unrealistic. In such a scenario, a risk based cleanup goal will be determined that protects the surrounding areas while allowing high levels of waste materials to remain in soils at the closed facility. A deed restriction will be required as part of such actions.

If limited groundwater impact is encountered it may be feasible for RFAAP to remove source material in the overlying soils and monitor groundwater quality as part of a natural attenuation program.

Finally, should significant soil and groundwater impacts be detected it will then be necessary to implement source soil removal/containment actions as well as groundwater containment or treatment measures.

At this time there are various options for excavating soil for off-site treatment/disposal as well as various on-site and in-situ treatment methods that may be applicable depending upon the exact nature of impacts to soil. For the purpose of this Closure Plan it is assumed that any potential soil impacts will be limited in nature and that soil excavation will be a feasible and cost effective closure option.

It should be noted that actual closure of the facilities is not anticipated for some time. As such, innovative treatment alternatives may become available that may be more favorable to excavation and off-site treatment/disposal. Based upon the actual extent of any impacts and technological advances, RFAAP may choose to modify this Closure Plan based upon findings when each facility is closed.

#### **~~H.G.5e.H.G.4c.~~ 5.3—Partial and Final Closure**

Final closure of the OBG is not anticipated in the near future, nor is partial closure is not anticipated for of any portions of the OBG. At such time that closure is expected, this Closure Plan will be reviewed and updated as necessary to reflect any changes to the closure philosophy or expected procedures. However, should any portions of the facilities OBG be closed prior to final closure, those portions will be closed in accordance with all applicable closure procedures in this Closure Plan or an approved, updated version of it.

— DETAILED CLOSURE PROCESS  
—

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## ~~II.G.6.6.0 — DETAILED CLOSURE process~~

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### ~~II.G.5.~~

This section presents a more detailed processes description of the closure process that is anticipated for the that will be used to close the OB Ground OBG considering the based upon the closure alternative selected in Section II.G.45.9. RFAAP has implemented a number of standard operating procedures that will be used to support the OB Ground closure. Pertinent elements of these procedures are incorporated into the closure process as described in the following sections. This process will include the following steps:

~~RFAAP will remove all hazardous waste and all hazardous constituents at the OB Ground at the time of closure (clean closure). All equipment and structures which may have contacted hazardous waste will then be decontaminated. Therefore, after closure, no waste is expected to be present at the facilities and post closure maintenance is not anticipated. Closure operations will occur following a predetermined approach as detailed and listed below and shown in the flow chart in Figure 3.~~

~~Specific items that are included in this section include the following:~~

1. Inventory Removal
2. Site Preparation
3. ~~Closure Construction~~ Evaluation of Surface and Subsurface Impacts
4. ~~Soil Treatment~~
4. Management and Disposal of Miscellaneous Materials
5. ~~Sampling and Analysis~~ Site Restoration
6. ~~Cover System Evaluation~~ Certification of Closure
7. ~~Interim Actions~~ Post-Closure Care and Groundwater Monitoring
- 7.

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~~7.~~ Figure II.F-4 provides a flow chart outlining the closure approach that is planned.

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## ~~II.G.6a:II.G.5a. 6.1 — Inventory Removal~~

The initial step in the closure process will be treatment and removal of the remaining hazardous waste. ~~The procedures for treating/removing the waste inventory are included along with procedures for managing any remaining wastes.~~

### 6.1.1 Treatment of Remaining Waste and Collection of Residuals

#### 6.1.1.1 — OB Ground

After receipt of the final quantity of hazardous waste at the facility (or specific portion thereof identified for partial closure), all hazardous waste inventory will be removed by treatment in the usual manner. Any remaining waste that cannot be treated will be transported for treatment/disposal at a permitted facility. Likewise, all ash will be collected and disposed of at a permitted disposal facility.

## 6.1.2 Management of Residual Wastes

### 6.1.2.1 OB Ground

After the final wastes have been processed and the ash residues have been removed, the OBG ~~The OB Ground~~ burning pans and covers will be removed. As defined above, the pans will be either decontaminated and handled as a non-hazardous waste or will be manifested to a RCRA permitted ~~off-site~~ disposal facility that is capable of handling the waste in accordance with all state and federal laws.

## II.G.6b II.G.5b. 6.2 Site Preparation

Comment [RFAAP7]: Revised this section to make it more specific to the OBG

Once the remaining hazardous waste inventory is treated, a series of preparatory activities will be performed prior to the start of actual facility closure. These activities will include the following ~~items~~:

1. Delineation of exclusion zones around the various work areas as needed for the safety of workers involved with the closure operations and those of RFAAP staff in surrounding areas. Specific items will be addressed as part of RFAAP safety policies and health and safety plans developed by any subcontractors involved in the closure operations.
2. Establishment of decontamination areas for personnel and equipment involved in the closure operations.
3. Establishment of staging areas for uncontaminated demolition debris, contaminated scrap/debris, contained liquids, and other waste streams including containers for any contaminated material. No waste or contaminated material shall be placed on the ground with or without a liner.
4. Establishment of temporary facilities required for closure activities (e.g., storage trailers, field office, etc.)
5. ~~Visual inspection of the b~~ ~~All secondary containment burning pads and/or building floor/sump surfaces will be visually inspected for the presence of~~ cracks or gaps. All such cracks or gaps will be sealed with an epoxy sealant ~~in order~~ to assure that wash solution will not migrate into or through the material.
6. Other permitting that may be required (e.g., modification of VPDES permit for treatment of wastes generated as part of the closure activities, VPDES storm water permit for construction activities, *etc.*).

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Comment [RFAAP8]: Removed as there is no secondary containment systems at the OBG

### 6.3 Decontamination and Closure of the ~~OB Ground~~ OBG Equipment

If RFAAP opts to decontaminate the ~~The Ob Ground~~ OBG burning pans and covers instead of disposing them as hazardous waste, the equipment will be placed into either a permanent or temporary containment structure. The equipment will then be decontaminated

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using a combination of mechanical cleanings and high and low pressure washes. Mechanical cleaning will involve the removal of visual residue on the pans via a combination of scraping, sweeping, or other appropriate methods. This will be followed by a single high pressure, low volume wash. The high pressure washing may include steam or detergent for more effective cleaning. Three successive low pressure ambient temperature water rinses will then follow this high pressure washes. The third, final rinse will then be collected and analyzed to verify the equipment's status as either hazardous or non-hazardous waste. If the rinsate samples indicate no contamination is present above regulatory levels, the equipment will be recycled or disposed offsite as non-hazardous waste. If the rinsate samples indicate that contamination is still present, RFAAP will either repeat the decontamination procedures or dispose of the equipment offsite as hazardous waste. ~~will be disposed of as hazardous waste; therefore, the pans and covers will not be decontaminated prior to disposal.~~

The concrete pads at the ~~OB Ground~~OBG will be mechanically cleaned and rinsed with high and low pressure washes. The high pressure washing will utilize a low volume of wash water and may include steam or detergent for more effective cleaning. Three successive low pressure ambient temperature water rinses will then follow these high pressure washes. The third, final rinse will then be collected and analyzed to show that the pad's surface meets established closure criteria. If the rinsate samples indicate no surface contamination is present above regulatory levels, the concrete will be removed and shipped offsite as non-hazardous waste. If the rinsate samples indicate that contamination is still present, RFAAP will either repeat the decontamination procedures or remove the concrete and ship it offsite as hazardous waste.

If no cracks or gaps were present in the pads, no core sampling will be performed. However, if cracks or gaps were noted during the initial visual inspection, core samples of the underlying soil will be collected. These core samples will be ~~broken up and representative samples will be collected and~~ analyzed for hazardous waste characteristics using the Toxicity Characteristic Leaching Procedure (TCLP) and hazardous characteristics of corrosivity, ignitability, and reactivity. If the results of the TCLP analyses indicate that the ~~concrete underlying soil~~ is hazardous, it will be ~~excavated, containerized~~ and shipped ~~off-site~~ to a permitted hazardous waste disposal facility. If the results of the TCLP and characteristic analyses indicate that the underlying soil is not contaminated, it will be left in place. ~~concrete is non-hazardous, it will be shipped off site in accordance with Virginia Solid Waste Management Regulations.~~

~~H.G.6e.~~

~~H.G.6d.~~

~~H.G.6e.II.G.5c.~~

## **6.5—Evaluation of Surface and Subsurface Impact**

### **6.5.1—OB Ground**

The burning pan loading area and ignition area will be surveyed for visible signs of a material release. A sampling program will be undertaken to determine the presence and/or extent of impact. All such sampling will be conducted in accordance with the soil monitoring program described in ~~If there is no release, a sampling program will be implemented to confirm that a release has not occurred. A soil monitoring plan has been prepared and is included in Attachment II-C of this Permit.~~

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**Comment [RFAAP9]:** Revised this section to reference the soil monitoring plan - Attachment II.C. Duplication of information contained in both plans is inappropriate and introduces the opportunity for discrepancies and conflicting requirements. To allow direct comparison of data, the methods employed during the ongoing soil sampling and closure sampling should be the same

~~A sampling grid will be established at each area where there is a potential for release or at a structure where sampling will be performed to confirm that a release has not occurred. The grid size and shape will be established based upon the lateral extent of the area in question. If appropriate, based upon the size of the area, grid points will be sampled using a statistically derived random pattern. Sample locations will be located within the area of concern and around the perimeter of the area to confirm the presence of a release and to establish the lateral extent of a release, if one has occurred.~~

~~For each set of two burning pans at the OB Ground (Figure 2), one soil sample will be collected from the area between the two pans (eight sets of two pans, for a total of eight soil samples). In addition, the area containing the eight pairs of burning pans between the access road and the river will be divided into 25 ft by 25 ft sampling grid. Eight additional soil samples will be collected in this area from grid points randomly selected using a statistically derived pattern. This will result in a total of 16 soil samples collected from the OB Ground. Any detection above background concentrations will be further investigated by sampling horizontally in all directions from the point of detection.~~

~~Prior to the performance of field work, a sampling plan will be prepared for the VDEQ documenting the potential areas of concern, identifying appropriate sampling grids for these areas, and an appropriate field assay procedure to augment the laboratory samples.~~

~~A soil boring will be advanced at the selected sampling points with discrete soil samples collected from the surface and every six inches to a depth of two feet. The soil samples will be analyzed for the constituents specified in Table 1 by appropriate methods from SW 846, latest edition. The method with the lowest detection limit for each constituent of interest will be used. The background shall be as approved by the VDEQ at the time of closure. The Background Study for the EPA Corrective Action Permit will be considered.~~

~~The constituents presented in Table 1 are derived from the Waste Analysis Plan for the facility. The compounds listed in the Waste Analysis Plan were compared to the list of hazardous constituents presented in Appendix VIII of 40 CFR Part 261. In addition, the comparison process included an evaluation of the Material Safety Data Sheets for the proprietary compounds and other generic substances listed in the Waste Analysis Plan in order to determine the specific chemical constituents of those substances. Those constituents that comprise the substances listed in the Waste Analysis Plan and that are also listed in Appendix VIII of 40 CFR Part 261 are presented in Table 1.~~

~~The soil sample analytical results will be compared to the approved background concentrations for the site. Grids and adjacent grids exhibiting concentrations above background will be removed for disposal at a permitted facility. If it becomes apparent that clean closure cannot be demonstrated to background during either initial sampling or subsequent sampling, a risk assessment protocol will be submitted to the VDEQ at the time of closure.~~

~~If necessary, based upon the analytical results of the soil survey and/or the results of the risk assessment, contaminated structures and subsoil's, including any groundwater that is~~



determined to be contaminated~~decontamination~~, will be removed and properly disposed~~of~~. Removal will continue until clean closure is achieved either to background or the approved risk-based standards. If clean closure can not be achieved then the facility will close ~~the site~~ as a landfill or in accordance with the applicable regulations.

## ~~II.G.6f.~~II.G.5d. 6.6—Management and Disposal of Miscellaneous Materials

The cleanup operations will likely result in the generation of other miscellaneous materials that may be contaminated during the cleanup process. ~~Potentially contaminated items used in the clean-up operations will likely be generated.~~ Such materials may include but may not be limited to the following:

- Brushes, brooms, mops, buckets and related cleaning supplies;
- Shovels, absorbents, and other tools; and
- Plastic sheeting.

All such waste materials will be ~~properly~~ characterized as required to facilitate onsite treatment or offsite disposal. ~~(including the hazardous characteristics of reactivity and toxicity and other parameters as appropriate) in accordance with state and federal laws. Based upon the characterization the wastes will be disposed at a properly permitted facility in accordance with state and local laws.~~ Liquid wastes may be discharged to the RFAAP wastewater treatment facility in accordance with the facility VPDES permit if such wastes are compatible with the treatment processes.

## II.G.5e. 6.7—SSite Restoration

Once the waste materials and ~~decontaminated~~ contaminated equipment have been removed from the site, the area ~~of surrounding~~ the ~~OB-Ground~~OBG will be restored. In the event that demolished foundation structures and/or other materials must be excavated for disposal ~~off-site~~offsite, site restoration will include backfill and compaction of any excavations, grading and revegetation of the affected area(s). All backfill material must be analyzed before use at the site to ensure that it is “clean fill.” The backfill material will be analyzed for the constituents specified in Table II.G-12 by appropriate methods from SW-846, latest edition. ~~Additional constituents may be added to the analyses at the time of closure, pending VDEQ approval.~~ In the event that it becomes necessary to conduct excavations at the time of closure, a detailed plan of the proposed excavation and site restoration activities will be submitted to the ~~VDEQ~~DEQ for approval.

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## II.G.6g.—Certification of Closure

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**6.8 Certification of Closure**  
**II.G.5f.**

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Within 60 days of completion of the closure ~~process, procedures the~~ Permittees will submit, by registered mail, a certification that the ~~OB Ground~~OBG has been closed in accordance with the specifications of this Closure Plan. The certification will be signed by an independent, Virginia registered professional engineer. The certification will also be signed by the Installation Commander, and a ~~and an Alliant~~ principal corporate officer ~~or~~ or duly authorized representative(s) of the contracted operator pursuant to 9 VAC 20-60-264 and 40 CFR Part 264.115.

**—Post-Closure Care and Groundwater Monitoring**

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~~II.G.7.7.0 — Post Closure Care And Groundwater monitoring~~  
~~II.G.5g.~~

As previously discussed it is the intent of RFAAP to “~~Clean Close~~” close the ~~OB~~  
~~Ground~~OBG such that there is unrestricted future landuse of the area. As such, no specific  
provisions for site monitoring, land restrictions, etc. have been included in this Closure Plan.  
Should site conditions change that would necessitate a change in the closure approach, such post  
closure care and monitoring may be warranted. If necessary, details of such activities will be  
developed in a future amendment to the Closure Plan. ~~Section 9.0 of this Closure Plan addresses~~  
~~the permit modification process in general that would be necessary to amend the Closure Plan in~~  
~~accordance with 40 CFR 264.112(e).~~

— CLOSURE COST AND SCHEDULE  
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## ~~II.G.8.8.0~~ CLOSURE COST and SCHEDULE

### II.G.6.

Federal facilities are exempt from the closure financial requirements pursuant to 9 VAC 20-60-264 and 40 CFR 264.114(c).

The Department will be notified at least 45 days before final ~~(clean)~~ closure of the ~~OB Ground~~ OBG is expected to begin. The date upon which closure is expected to begin will be the date upon which the final volume of hazardous waste is received at the ~~OB Ground~~ OBG. Table II.G-2 shows the proposed schedule from notification of the department through submittal of the closure certification. As shown in the ~~Tables~~, all closure activities are to be completed within 180 days. Certification of closure must be made within 60 days after the completion of closure activities, ~~or at or before day 240 of closure~~. This time frame allows for the required sample analyses, additional decontamination and/or soil removal (as needed), and re-sampling. In the event that the proposed timeframe proves insufficient for the completion of closure activities, the permittees will submit a demonstration for the need for additional time.

In the event that the RFAAP is unable to complete closure of the OBG within the timeframe established above and outlined in 40 CFR 264.113, RFAAP will request an extension to the closure period. In making this request, RFAAP will provide a demonstration that the required closure activities will take longer than 180 days to complete and RFAAP has and will continue to take all steps necessary to prevent threats to human health and the environment from the unclosed but not operating hazardous waste management unit, including compliance with all applicable permit requirements. Pursuant to 40 CFR § 264.113(c)(2), the request for an extension of the closure period will be made at least 30 days prior to expiration of the 180-day period allotted for closure.

If the facility's permit is terminated, or if the facility is otherwise ordered, by judicial decree or Order of the Board, to cease receiving hazardous waste, ~~OB Ground~~ OBG will be closed in accordance with the deadlines established in 9 VAC 20-60-264 and 40 CFR 264.113.

## II.G.7. MODIFICATION TO CLOSURE PLAN

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#### **~~II.G.9.9.0 — Modification to Closure Plan~~**

The permittees will submit a written request for a permit modification to authorize a change in the approved Closure Plan whenever:

1. Changes in operating plans or facility design affect the Closure Plan;
2. There is a change in the expected year of closure, if applicable; or
3. In conducting partial or final closure activities, unexpected events require a modification of the approved Closure Plan.

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The permittees will submit a written request for a permit modification including a copy of the amended Closure Plan for approval as follows:

- At least 60 days prior to the proposed change in facility design or operation; or
- No later than 60 days after an unexpected event has occurred ~~which~~-that has affected the Closure Plan.

If an unexpected event occurs during the partial or final closure period, the permittees will request a permit modification no later than 30 days after the unexpected event. The Department will approve, disapprove or modify this amended plan in accordance with the procedures in 40 CFR Parts 124 and 270. In accordance with 40 CFR 270.32, the approved Closure Plan will become a condition of this Permit.

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## Figures

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**Figure II.G-1** — Location Map

**Figure II.G-2** — ~~Plot Plan~~ Topographic Map

**Figure II.G-3** — ~~Area Map~~ Layout of Burning Ground Structures

**Figure II.G-4** — Logic Diagram

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**Tables**

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**TABLE II.G.1**

**HAZARDOUS CONSTITUENTS FOR EVALUATION  
DURING CLOSURE OF THE CONTAINED IN WASTES TREATED AT THE OPEN  
BURNING GROUND  
Radford Army Ammunition Plant**

Parameter	CAS #	Analytical Method (SW-846)	Estimated Quantitation Limits(µg/L)
<del>II.G.10a.</del> Antimony sulfide	(Antimony)	6020	1
(Antimony Compounds N.O.S.)	7440-36-0		
<del>II.G.11.</del> Arsenic	7440-38-2	6020	5
Barium N.O.S.	(Barium)	6020	10
	7440-39-3		
Benzene (possibly in alkylbenzene sulfonic acid)	71-43-2	8260B	5
Chlorobenzene	108-90-7	8260B	5
Carbon tetrachloride (1.5 % of Chlorowax 70)	56-23-5	8260B	5
<del>II.G.12.</del> Chromium nitrate	(Chromium)	6020	5
(Chromium compounds N.O.S.)	7440-47-3		
<del>II.G.13.</del> Dibutyl phthalate	84-74-2	8270C	10
(Di-n-butyl phthalate)			
Diethyl phthalate	117-81-7	8270C	10
Dinitrobenzene, N.O.S.	25154-54-5	8270	10
<del>II.G.13a.</del> 2,4-Dinitrotoluene	121-14-2	8091	0.08
<del>II.G.13b.</del> Diphenylamine	122-39-4	8270C	10
Formaldehyde (found in phenolic resin)	50-00-0	8315A	25
Hexachloroethane	67-72-1	8270C	50
Lead N.O.S.	(Lead)	6020	1
	7439-92-1		
<del>II.G.14.</del> Mercury	7439-97-6	7470A	2
Mercuric chloride (CAS# 7487-94-7)	(Mercury)	7470A	2
(Mercuric Compounds N.O.S.)	7439-97-6		
<del>II.G.14a.</del> Methyl chloride	74-87-3	8260B	5
<del>II.G.14b.</del> Methylene chloride	75-09-2	8260B	5
Nitroglycerine	55-63-0	8332	10 mg/L
Nitrosamines, N.O.S.	Multiple	8330	Varies
Total Phenols (found in phenolic resin)	108-95-2	9066	5
Silver	7440-22-4	6020	2
Toluene	108-88-3	8260B	5

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N.O.S: Not Otherwise Specified, signifies those members of the general class not specifically listed by name in Appendix VIII of 40 CFR Part 261.

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TABLE II.G-2

**PROPOSED CLOSURE SCHEDULE**  
**OB-Ground Open Burning Ground**  
**Radford Army Ammunition Plant**

Days From Beginning of Closure	Event
- 45	Notification of Department
0	Receive last volume of waste
0-2	Treat final volume of waste
2-5	Remove residuals from burning pans
5-15	Select tentative locations for background sampling, seek approval from Department
15-20	Inspect for cracks in burning padssecondary containment
20-30	Disassemble, Clean, and decontaminate burning pans and covers
30-75	Sampling—Sample wash water
55-100	Sample analysis
55-75	Soil Samplingsampling
100-125	Soil Removalremoval (if necessary)
90-125	Repeat sampling and analysis (if necessary)
110-140	Additional soil removal (if necessary)
90-150	Repeat sampling and analysis (if necessary)
180	Completion of closure activities
240	Submit signed closure certification to the Department
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240	Submit signed closure certification to the Department

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Times, in days, are from the date upon which closure begins.

## **MODULE III – OPERATING CONDITIONS**

**Comment [RFAAP1]:** Suggested revisions added June 2015 as part of the RCRA permit renewal application for the RFAAP open burning ground

### **III.A. GENERAL**

This Module is organized with separate Parts to identify the operational and performance requirements that are specific to the ~~OB-Ground~~ **OB** open burning ground (OBG)s.

The ~~OB-Ground~~ **OB** is located along the banks of the New River in the southeastern portion of the Radford Army Ammunition Plant (RFAAP) known as ~~of the horseshoe area-bounded by the river.~~ The OB operations are conducted in an area approximately 100 feet by 1,500 feet (see Figure III-1). The actual burning of explosive waste is performed in ~~six~~ 6-foot by ~~18~~ 18-foot burning pans that are located on approximately 250-foot square raised pads ~~about 250 feet square.~~ There are eight raised pads in the area, each ~~consisting holding of two raised-burning~~ pans for a total of 16 pans.

### **III.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION**

**Comment [RFAAP2]:** Revised this section to be consistent with changes made to the WAP

#### **III.B.1**

~~Those hazardous wastes that may be managed at the permitted open burning grounds are waste energetic materials and spill "clean-up" residues generated at the Radford Army Ammunition Plant (RFAAP) by either the contracted operator (the Permittees) or one of the RFAAP tenant organizations. No wastes generated outside of the RFAAP will be received, stored, or treated at the permitted storage and treatment area. Hazardous wastes that may be managed at the permitted open burning grounds are waste propellants and spill "clean-up" residues generated at Radford Army Ammunition Plant (RFAAP) which are hazardous due to their ignitability (D001) or reactivity (D003).~~

Only those hazardous wastes, ~~which are~~ that are consistent with the requirements of the facility's RCRA Permit and that are described ~~specified~~ in Module II, Attachment II.B Waste Analysis Plan (WAP) will be open burned. Of the 20 groups of wastes described in the WAP, wastes from all groups except Groups 2, 3, 5, and 6 may be treated by open burning. Under no circumstances will the following materials be managed at the open burning ground:

- i. Radioactive wastes, or mixed radioactive and hazardous wastes;
- ii. Wastes that are listed pursuant to 9 VA 20-60-261, incorporating 40 CFR 261.31, 32, and 33, by reference, will be managed at the permitted treatment area.

- iii. Any material contaminated with or suspected of being contaminated with military warfare agents accepted for thermal treatment at the OB unit. Examples of such chemical warfare agents are:

Choking agents  
Nerve agents  
Blood agents  
Blister agents  
Incapacitating agents  
Vomiting compounds  
Tear producing compounds  
Herbicides

- iv. Smoke and incendiary devices, as these materials are not suitable for treatment at the OBG for a variety of reasons.

~~Only wastes generated at RFAAP by the Permittees may be treated at the OB Ground. At NO TIME will any of the following wastes be open burned at RFAAP:~~

- ~~Listed Wastes~~
- ~~Wastes generated outside of RFAAP~~
- ~~Wastes in Group 2 – Miscellaneous Waste – Propellant Laboratory Waste~~
- ~~Wastes in Group 3 – Miscellaneous Waste – Pit Cotton (Waste Nitrocellulose) – Solid Waste~~
- ~~Wastes in Group 5 & 6 – Liquid Wastes – Waster Containing Triethylene Glycol or Diethylene Glycol – Solid Waste~~
- ~~Small arms ammunition up to 50 caliber, Chemical agent munitions, Riot control munitions, White/red phosphorous, Incendiaries (e.g., napalm), Colored smokes, Depleted uranium (DU) munitions~~

III.B.2 Some of the materials treated at the ~~OB Ground~~OBG are the same wastes that would be treated at the incinerator except that they may contain rocks, tramp metal, and other foreign object debris (FOD) that will damage the incinerator grinder or present an explosion hazard in the grinder. In addition, those ~~Penergeticropellant~~ wastes that will not feed into the grinder due to ~~its~~their physical shape or thickness, and those energetics that have ~~material that~~through Hazard Analysis been designated as unsafe for the grinder or incinerator ~~is determined that it cannot be safely incinerated but can may be open burned are also~~ treated at the ~~OB Ground~~OBG.

III.B.3 ~~Table III-1 represents~~The performance standards for the OBG have been established to ensure protection of human health and the environment. These standards have been based upon site-specific demonstrations made in the ~~set forth by the~~ Human Health and Ecological Risk Assessments for skid burns and propellant burns, respectively.

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**Comment [RFAAP3]:** Note: These tables and limits are a direct result of the previous risk assessment. DEQ has directed RFAAP to conduct a new assessment for the OBG. Therefore, this permit requirement has been revised to allow addition of limits after completion of the risk assessment, if necessary. All old limits have been removed pending completion of the new assessment, as they may be proven inappropriate with new assessment methodologies or new toxicological parameters.

In general, each open burn shall be limited as follows to protect human health and the environment:

- Propellant burns - The lesser of 8,000 pounds or that size required by a specific constituent as detailed in Attachment III.A
- Skid burns - The lesser of 2,000 pounds or that size required by a specific constituent as detailed in Attachment III.A. ~~At no time should the feed limits or aggregate constituent concentrations in an open burn exceed the limits presented below. presented in this table be exceeded. In addition to Table III 1, Table 2 of Attachment II.B, presents the composition limitations for all of the constituents treated at the OB Ground.~~

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Comment [RFAAP4]: Removed this table. See Attachment II.B for discussion.

~~The following feed limits have been set with regards to specific constituents treated at the OB Ground and supersedes the concentrations mentioned in the above referenced Table 2.~~

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Comment [RFAAP5]: Removed the limits specified below from the text as they will be revised with the new risk assessment. Per above text, recommend incorporating all limits into Attachment III.A, to allow ease of application following completion of the risk assessment.

~~A. Barium (propellant burn)\*~~

~~No greater than 88 ppm of barium for 8,000 lb propellant burn~~

~~No greater than 207 ppm of barium for a 3,400 lb propellant burn~~

~~Barium (skid burn) \*~~

~~No greater than 88 ppm barium for a 2,000 lb skid burn~~

~~No greater than 160 ppm barium for a 1,100 lb skid burn~~

~~No greater than 352 ppm barium for a 500 lb skid burn~~

~~B. Chromium~~

~~No greater than 12 ppm of chromium will be burned at the OB Ground~~

~~C. Aluminum~~

~~No greater than 1 wt% of aluminum will be burned at the OB Ground~~

~~\* RAAP is allowed to burn barium at these limits provided that, 1) the concentrations of the other constituents in the waste streams remain the same as indicated in the Permit; and 2) RAAP conducts only one burn per day and the total amount of waste burned per day does not exceed the amounts mentioned above.~~

### III.C

#### OB-GROUND OPEN BURNING GROUND OPERATIONS

##### III.C.1

~~The lowest elevation of the OB Ground nearest the New River is girded by a 4 to 6 foot high, crushed rock berm. The rear portion of each burn pad is located, at a distance of 10 feet from this the rock berm and is raised to provide a flat surface on the sloping topography (see Figure III-2). The elevated pads on which the pans are placed prevent surface water run-on, but do not prevent surface water run-off from the pad. Stormwater run-on and run-off at the OB Ground will comply with 40 CFR 264.273. Stormwater Management Improvements for the RFAAP OB Grounds to control run-on and run-off have~~

Comment [RFAAP6]: This provision was written to ensure compliance with 40 CFR § 264.273 PRIOR TO implementation of the stormwater improvement project at the OBG. Given that these improvements were long since made and accepted by DEQ, this section is no longer applicable as written. We have revised this section to describe the methods by which the existing facility complies with 264.273 and have removed reference to the attachment, which is no longer applicable. Drawings have been added in place of the attachment.

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~~been included in Attachment III-A.~~ The OBG is located along the banks of the New River in the southeastern portion of the RFAAP known as the horseshoe area. Each of the 16 burn pads utilized in the OBG operations has been configured to provide an elevated, impermeable surface on which to place the open burning pans and conduct the open burning operations. Figure III-2 provides a graphical representation of the typical pad configuration.

As shown in the figure, each pan is elevated sufficiently above the adjacent New River and is protected by a stormwater berm and stormwater trench. In addition, four drainage areas are provided to collect stormwater generated from precipitation events. Water collected in the drainage areas is then directed away from the OBG using a series of diversion berms, drainage culverts, and swales. These, and other unit design features, have been structured to ensure proper management of run-on and run-off in accordance with 40 CFR § 264.273. Figure III-3 provides an overview of the stormwater management features associated with the area.

- III.C.1.a. The run-on control system has been designed pursuant to 40 CFR § 264.273(c) to prevent the flow of water onto the OBG during peak discharge resulting from a 24-hour, 25-year storm. This run-on control system includes a series of diversion berms and drainage culverts that direct the discharge from a design storm away from or around the OBG site and redirect it back to the River through RFAAP Outfall #12. These features are depicted on Figure III-3.
- III.C.1.b. The run-off control system has been designed pursuant to 40 CFR § 264.273(d) to control the volume of water resulting from a 24-hour, 25-year storm within the confines of the OBG. This run-off control system includes four separate drainage areas and a series of containment berms, trench drains, and culverts that direct collected water to a sediment basin and prevent it from overtaking the OBG site. Stormwater releases from the sediment basin are controlled via a principal spillway that discharges through RFAAP Outfall #17. These features are depicted on Figure III-3.
- III.C.2 The Open Burning Ground is composed of 16 burn pans. Two types of burns are performed on these pans: propellant burns and skid burns. Each burn utilizes a maximum weight of 1,000 pounds of energetic material per burn pan, with typical weights being much less. Each of these burn scenarios were evaluated in the site-specific human health and ecological risk assessment using the criteria described below.

Propellant burns are conducted with materials that do not require an aide in burning. The material included in these burns is spread directly on the pan and ignited with a remote igniter. Pursuant to III.B.3, ~~P~~propellant burns are limited to

no more than 8,000 pounds of energetic waste per day and can be performed 365 days per year, weather permitting.

For those wastes that require an aid to burning, a skid ~~consisting of 5~~ wooden pallets ~~are is~~ covered with ~~a cloth or cardboard~~, treated with ~~12.5 gallons of on-road diesel fuel~~, and ignited. Placing the wastes on the pallets and treating them with diesel fuel helps to encourage air movement, provide adequate fuel for the process, and support proper combustion of the waste. Pursuant to III.B.3, ~~This type of assisted burn or "skid burn" It is assumed that is limited to no more than a maximum of two pans per day, for a total weight of 2,000 pounds of energetic waste per day spread over multiple pans as necessary. Skid burns may also be performed 365 days per year, weather permitting. would require a skid; the facility refers to the non-energetic burns as "Skid Burns". The facility used the currently reviewed human health and ecological risk assessments to support the following limits for the RCRA Subpart X operating permit:~~

- ~~Propellant Burns of 8,000 pounds / day for 365 days / year~~
- ~~Skid Burns of 2,000 pounds / day for 365 days / year~~

~~These two burn scenarios correspond to 2,920,000 pounds of propellant burns per year/ year and 730,000 pounds of skid burns per year (not including the weight of the skids). Annual diesel fuel usage for the skid burns is estimated to be no more than / year respectively and, assuming two skid burns per day, 9125 gallons of diesel fuel per year. The facility has indicated in the Human Health Risk Assessment (HHRA) that the Open Burning Ground typically operates approximately 260 days / year.~~

### III.C.3

Figures ~~III-3-4 and III-8~~ provides construction and material details of the burn pans, supports, and pads. ~~Figure III-4~~ The figures also provides details of the pan covers, which are mounted on wheels and can be rolled manually over the pans to prevent rain from collecting in the pans and overflowing onto the ground. ~~OB Ground~~ OBG Schematic's are presented in Figures ~~III-5-5 through III-88~~. The burning pans are ~~each~~ lined with six inches of clay or ceramic mastic to insulate the metal from the intense heat of burning. There are no liners or leak containment systems below the burning pans, ~~as only solid materials are treated in the pans~~. The pans are inspected daily prior to loading to ensure that they are not leaking.

### III.C.4

Each morning that the ~~OB Ground~~ OBG plans to operate the Chief Burning Ground Operator or the Area Manager checks the local weather ~~foreeas~~ forecast to evaluate predicted precipitation events, wind speeds, New River level, Pond level at Claytor Lake, and recent rainfall at the headwaters of the New River in North Carolina. ~~It is the decision of~~ Based on this forecast, the Chief Burning Ground Operator or the Area Manager then decides whether to ~~to~~ begin loading the pans. ~~Factors that the Area Manager considers are the precipitation forecast, wind~~

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~~speed, river level, Pond level of Claytor Lake, and excessive rainfall in the headwaters of the New River in North Carolina. If the precipitation forecast is predicts greater than a 50% chance of precipitation within 3-hours of the start of a burn or if the winds are >greater than 20 miles per hour, the area-Area manager Manager will not allow open burning to commence. If the winds are below 20 miles per hour and there is no precipitation at the time of ignition, the operations will commence. Also, if a precipitation forecast of greater than 50% is predicted by the weather service providers within 3 hours of the start of a burn then the area manager will not allow open burning to commence. Once the pan is loaded with waste the waste cannot be removed safely from the pan. If precipitation occurs after the pans have already been loaded but before they are ignited, then the pans will be covered prior to ignition and no open burning will occur. If precipitation occurs unexpectedly during firing of a pan, the materials will be inspected after the burn is complete. Any unburned materials will be reworked into a new pan and will be refired. The burning ground will not intentionally operate during precipitation nor will operators be working if there is during a thunderstorm in the local vicinity of the burning ground. Also refer to III.E.~~

#### III.C.5

~~Prior to each burn, The pans and the surrounding area from the previous day's operations are visually inspected for material that may not have been consumed in the previous burn. If the operator sees any unburned material, the residue is collected and is placed on another burning pan for treatment. Further information on facility inspections is provided in Attachment III.E. Refer to III.E.~~

~~After this initial inspection, On a routine daily basis, the pans are loaded with waste selected from the plant's less than 90-day accumulation areas. The criteria for selection are the accumulation start date, the theoretical burn rate of the material (to ensure that fast burning material is not covered by slower burning material), and the aggregate pollutant concentrations in the proposed burn.~~

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~~Pads used for burns are alternated each day, with odd-numbered pads being used one day and even-numbered pads being use the next. on alternate pads are loaded during the morning hours.~~

Comment [RFAAP7]: Removed. This is a safety limitation and has no effect on unit emissions as long as total waste limits are observed.

~~The waste to be open burned is selected from the plants less than 90 day accumulation areas. The criteria for selection are the accumulation start date and the theoretical burn rate of the material. The theoretical burn rate is used to ensure that fast burning material is not covered by slower burning material. The materials contained in covered plastic 20-gallon tubs or DOT approved fiber drums are unloaded at the appropriate pan. The waste is kept at a critical height to prevent detonation. The waste capacity of each pan is 1000 pounds. To prevent untreated material from landing on the soil the operator may burn considerably less material.~~

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~~III.C.6 Skid Burns at the OB Ground OBG require an aid to burning. These wastes are placed on wood pallets to allow air under the waste. The pallets are covered with a cloth material that is soaked with diesel fuel. The waste is spread onto the cloth and soaked with diesel fuel. The fuel aids in combustion of the waste.~~

Comment [RFAAP8]: Deleted, as it duplicated a prior description.

III.C.76 The arming circuit used for burn ignition is checked for continually continuity and the squib trigger device is placed in the pan and covered with dry propellant.

The operators then proceed as follows:

- Assure that all personnel are away from the burning pan area.
- Hook cables across upper roadway.
- Record the following information on DUP-7714 just before firing:
  - (1) Sky condition (Use Codes) – AWAS
  - (2) Visibility – AWAS
  - (3) Temperature (Deg. F)
  - (4) Wind Speed (Should not be > 20 mph)
  - (5) Wind Direction
  - (6) Area Operational (Yes/No/NMTB\*)
  - (7) Cloud Ceiling Height
  - (8) Type of material Destroyed
  - (9) Remarks (Chance of Precipitation should not be >50%)

Turn DUP-782, "Tracking Record and Disposition of Waste Propellant or Nitro-Cotton Burning Ground Report" or DUP 782A, Burning Ground Report For Use with Material Control Work Orders Only, into area office to file.

III.C.87 The burning ground pans have a waste capacity of 1000 pounds each, for material that will produce a mass fire, not an explosion or a detonation. To ensure the safety of the few boaters that use the river in front of the OB ground OBG, Radford posts a person across the river approximately 200 feet upstream from pad Pad number-Number 8 and 200 feet downstream from pad-Pad number-Number 1 as well. This distance provides more than double the Army's recommend distance for mass fire from public traffic route. The Waste will not be ignited if a person is observed on the river shoreline between these 2 observation posts. The observers and the burning ground operators turn on rotating red lights that are placed-located along the river in front of the burning ground to advise boaters that the burning ground is about to begin operations. In addition, Aa siren is sounded for about approximately 10 seconds, and the operator makes the following

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Comment [RFAAP9]: This form does not exist. Removed erroneous reference to it.

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~~announcement twice over a loud speaker followed by the operator making the following announcement twice:~~

“Warning, the Burning Ground of the Radford Army Ammunition Plant is about to begin Burning Operations. Evacuate the River Area immediately.”

The burning pans are not ignited until assurance is received from both observers that the area between them is clear. If anyone is observed within these locations, they shall be verbally warned to move from the area. Burning shall not be performed until the area is clear.

The wastes are ignited only after the operator is sure that no one is on the river and that all of the procedures for ignition have been followed. ~~Operators wait at least one-half hour after a burn before approaching a pan to examine the residue.~~

### III.D ASH/RESIDUE MANAGEMENT

~~Operators wait at least one-half hour after a burn before approaching a pan to examine the residue. Generally, the morning following the burning operations, the operator inspects the pans that were used the previous day. Any untreated waste is collected and placed on a pan for re-treatment as described previously. Any inert residue~~ The remaining residue is collected and placed in a container at the ~~OB-ground~~ OBG less than 90 day accumulation area.

Prior to placing the residue into the accumulation container a ~~one-half cup~~ grab sample of residue is obtained and placed in a separate small container. Each day that ash residue is collected in the pans, a small sample is taken and added to the composite ash sample container. ~~added, a sample is collected. At~~ After approximately day 60 of accumulation, the samples are thoroughly mixed and is sent to the RFAAP Technical Analytical Laboratory to evaluate the reactivity and to test for oxidizing compounds. On an annual basis, the facility performs a full TCLP analysis of the ash composite for regulated metals and for underlying constituents of concern ~~composited and sent off site for toxic characteristics. For the following waste streams, D004—D011, the facility will do TCLP analysis. Also, all underlying constituents must be analyzed~~ to make sure that the waste meets Land Disposal Restrictions (reference 40 CFR 268.48). ~~At least once per year the residue is analyzed in accordance with 40 CFR 268.48 for underlying constituents of concern.~~

~~A split sample is sent to the on-site laboratory for propellant analysis. The residue is considered not reactive if less than 10% of the residue is propellant. Historically less than 0.5% of the residue is propellant.~~

~~The same reactivity test conducted on incinerator residue is conducted for the OB Ground annually. If the waste residue is not reactive, it still must pass for all underlying constituents before land disposal. Annually the ash is analyzed for explosive compounds using SW 846 Method 8330.~~

Comment [RFAAP10]: Removed as this is discussed above and was previously duplicated here.

Upon receiving the results analysis from the RFAAP Technical Analytical Laboratory the waste is shipped to a permitted landfill for disposal in accordance with all Virginia and federal laws and regulations.

In addition to providing information required for proper disposal and shipping of the residue, the reactivity analyses described above are used to demonstrate compliance with 9 VAC 20-60-1010.K.8, which requires the facility to provide a demonstration of the effectiveness of the thermal treatment process.

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### III.E INSPECTION SCHEDULE AND PROCEDURES

The Permittee shall inspect the ~~OB Ground~~OBG in accordance with the inspection schedule set out in Attachment II.D.

### III.F MONITORING REQUIREMENTS

The Permittee shall conduct monitoring of the wastes treated at the ~~OB Ground~~OBG in accordance with Attachment ~~XXX~~II.B.

The Permittee shall conduct ground-water monitoring at the ~~OB Ground~~OBG in accordance with Permit Modules IV, V, and/or VII as appropriate.

The Permittee shall conduct soil monitoring at the ~~OB Ground~~OBG in accordance with the Soil Monitoring Program provided in Attachment II.C.

### III.G FACILITY MODIFICATION AND EXPANSION

Permit Modification – Virginia DEQ reserves the right to modify this Permit in accordance with 40 CFR 270.41.

Permit Modification at the Request of the Permittee Modifications or expansions of the facility shall be accomplished in accordance with 40 CFR 270.42.

### III.H RECORDKEEPING AND REPORTING

The Permittee shall comply with all applicable procedures for recordkeeping and reporting requirements provided in 40 CFR 264.73 (b) and 268.7, along with, the Inspection Schedule presented in Attachment II.D. Also refer to III.C.7 and Section II.I.

III.H.1 **WASTE MINIMIZATION PLAN**

The Waste Minimization Plan is included in Attachment III.B. The plan was designed to address RFAAP continued efforts to reduce the amount of hazardous waste sent to the ~~OB Ground~~OBC.

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## FIGURES



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**FIGURE III-1 AREA MAP**  
**FIGURE III-2 PAN PROFILE**  
**FIGURE III-3 STORMWATER MANAGEMENT DESIGN**  
**FIGURE III-4 PAN AND COVER DETAILS**  
**FIGURE III-5 PAN AND COVER DETAILS**  
**FIGURE III-6 PAN AND COVER DETAILS**  
**FIGURE III-7 PAN AND COVER DETAILS**  
**FIGURE III-8 PAN AND COVER DETAILS**

### **MODULE III – LIST OF ATTACHMENTS**

The following Attachments are incorporated, in their entirety, by reference into this Permit. These incorporated attachments are enforceable conditions of this Permit. Some of the documents contain excerpts from the Permittees' Hazardous Waste Permit Application. The Department has, as deemed necessary, modified specific language excerpted from the permit application. Additional modifications are prescribed in the Permit Conditions (Modules I through IX), and thereby supersede the language of the attachments. Facility operations shall be in accordance with the contents of the Attachments and this Permit.

Attachment III.A – ~~Stormwater Management Improvements for the Radford Army Ammunitions Plant Open Burning Ground~~ Site-Specific Performance Standards for the Open Burning Ground (Reserved)

Attachment III.B – Waste Minimization Plan

**Comment [RFAAP11]:** Deleted old attachment as it is no longer applicable (see earlier comments). Replaced with attachment that will, after the risk assessment, contain the site-specific limits that are needed.

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**FIGURES**